
This is a reproduction of a library book that was digitized by Google as part of an ongoing effort to preserve the information in books and make it universally accessible.

GoogleTM books

<https://books.google.com>



UC-NRLF



B 2 905 180

FRANK'S ANNUAL
THE ARMY & NAVY YEARBOOK

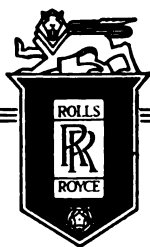


SEVENTH SEVENTH YEAR OF PUBLICATION

W. & A. CLOWES & SONS LTD LONDON



18/08



PROGRESS

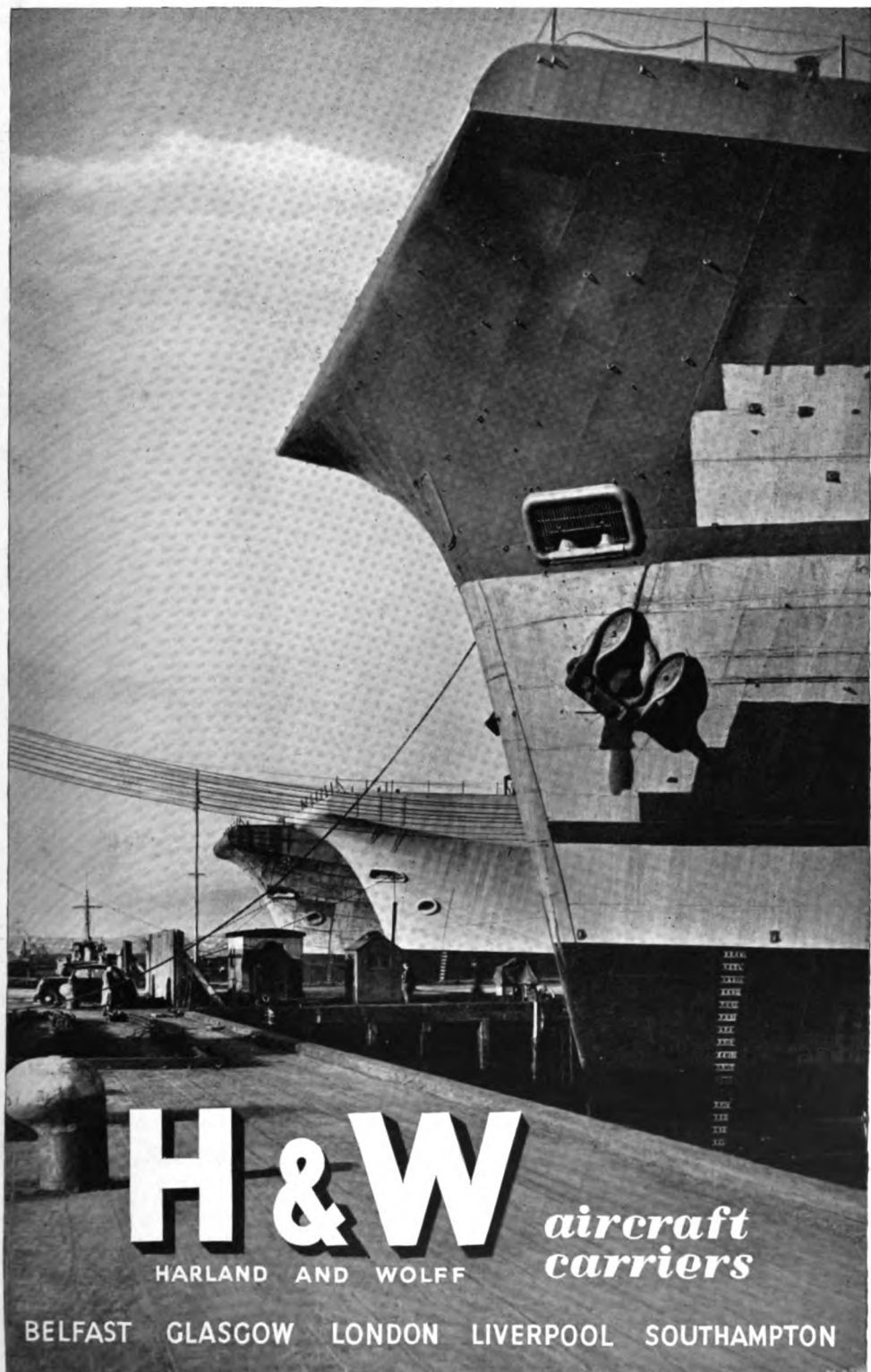
Rolls-Royce produce turbo-jet, propeller-turbine and piston aero engines to suit all types of medium and high-powered aircraft.

For wheeled vehicles Rolls-Royce make a series of 'Rationalised' petrol engines, with interchangeable parts, ranging from 80 to 160 b.h.p.

ROLLS-ROYCE

ROLLS-ROYCE LTD • DERBY
Telephone: Derby 2424 Telegrams: Roycar, Derby





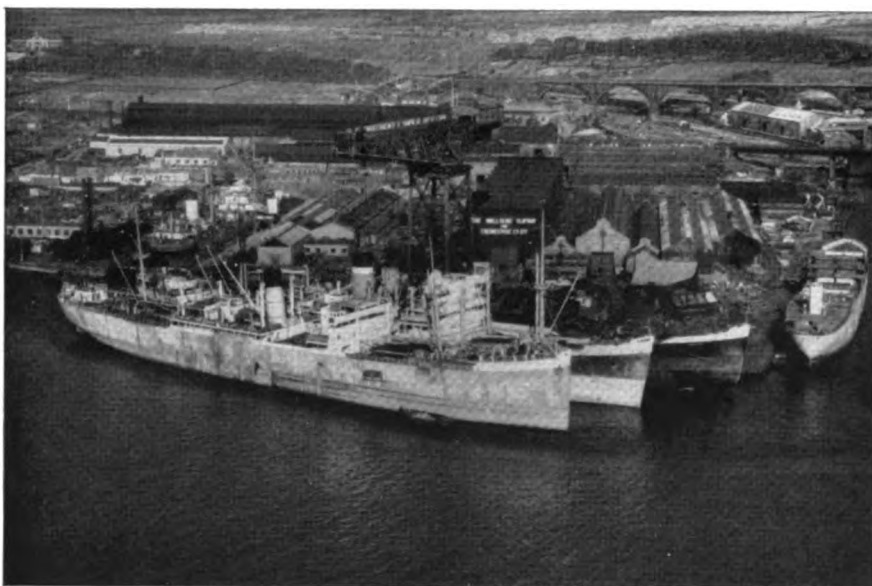
H & W
HARLAND AND WOLFF

*aircraft
carriers*

BELFAST GLASGOW LONDON LIVERPOOL SOUTHAMPTON

WALLSEND SLIPWAY & ENGINEERING CO. LTD.

Engineers, Boilermakers,
Oil Burning Specialists,
and Ship Repairers



View of the Works

Builders of Steam Reciprocating, Turbine,
Wallsend-Sulzer and Doxford Opposed Piston
Oil Engines as well as Marine Multitubular
Boilers, Yarrow, Foster-Wheeler, and Howden-
Johnson Boilers for War and Merchant Ships.

Head Office :

London Office :

Liverpool Office :

WALLSEND-ON-TYNE

34, GREAT ST. HELEN'S, E.C.3

CUNARD BUILDING



WAYNE PATENT SELF-WINDING **REELS** For ELECTRIC CABLE and HOSE

are available for every type of Military, Naval, or R.A.F. vehicle as well as for engineering and construction work. Whatever your special requirements may be, you can be certain of expert advice by writing to Power House Components Ltd.

WAYNE ARMoured INFANTRY TANK **TELEPHONE** **BOX**

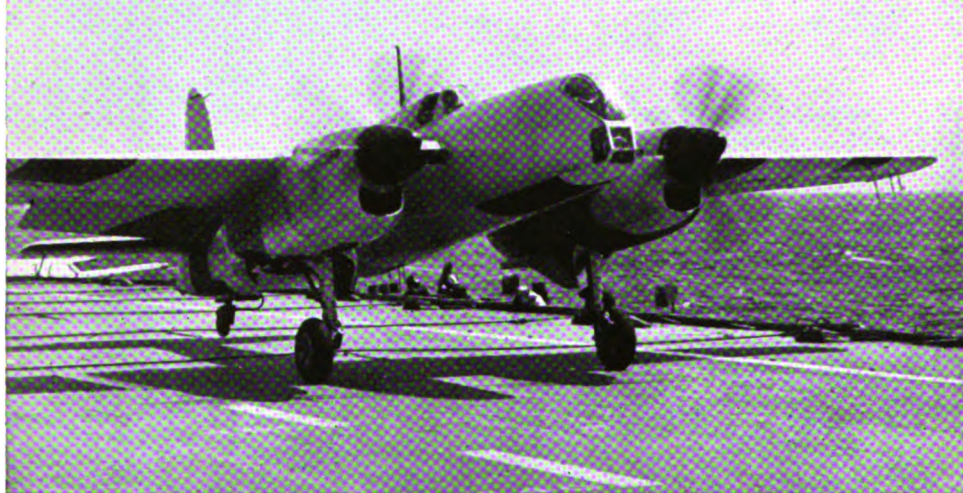
Designed to re-wind automatically a rubber hand set telephone required in first line vehicles. Infantry-men can communicate direct with the tank commander while under actual fighting conditions.



Sole Patentee and Designer
DAVID RUSHWORTH

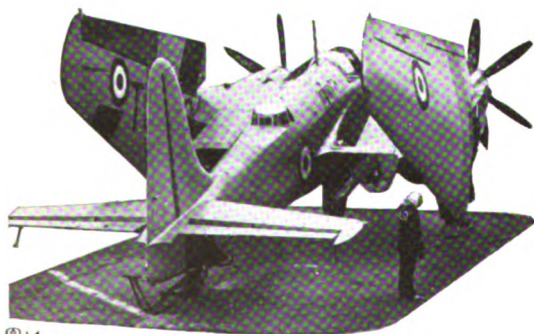
POWER HOUSE COMPONENTS LTD
ALBION CHAMBERS, KING STREET, NOTTINGHAM

Sturgeon with the Fleet!



*Aiding the
Royal Navy
to maintain
efficient
gunnery*

The problem of providing the Navy with realistic gunnery practice at any time, anywhere, was solved by Shorts with the Sturgeon T.T. Mk.2. Designed as a carrier-borne target-tower to accompany the Fleet far beyond the range of shore-based aircraft, the Sturgeon carries a crew of two, pilot and navigator, and is equipped for the following duties: *target towing for ground-to-air firing practice; photographic marking; target towing for air-to-air firing practice by day and night; throw-off target practice and marking; Radar calibration.* Provision is also made for rocket assisted take-off and catapulting.



For carrier stowage beneath the flight deck the Sturgeon folds to one-third of its total wing span, whilst the forward portion of the nose hinges down to reduce its overall length and to give easy access to the range of equipment contained therein.

Shorts

*The first manufacturers of aircraft
in the world*

STURGEON T.T. MK2

H.M.S. "LAFOREY"



From the painting by Bernard Gribble

YARROW

& CO. LTD. GLASGOW

Designers and Constructors of

**FLOTILLA LEADERS, DESTROYERS,
SLOOPS, GUNBOATS, ARMED LAUNCHES,
ETC.**

•

TURBINE AND RECIPROCATING MACHINERY

•

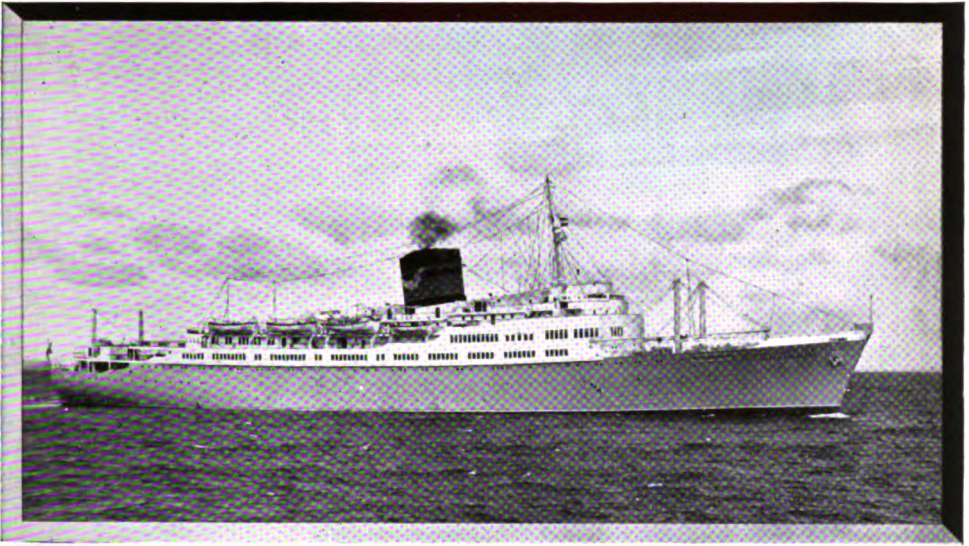
YARROW PATENT HIGH PRESSURE WATERTUBE BOILERS

•

**SHALLOW DRAUGHT VESSELS
OF ALL DESCRIPTIONS
ETC.**

Blackburn
AIRCRAFT

BLACKBURN & GENERAL AIRCRAFT LTD.
BROUGH, E. YORKS.



The 13,654 ton 'Ocean Monarch', built by Vickers-Armstrongs, Walker-on-Tyne, for the Furness Bermuda Line

Vessels completed at Barrow and the Naval Yard within the last year include :

NAVAL YARD

'PATROCLUS'	10,109	TONS, GROSS	CHINA MUTUAL S.N.CO LTD. (A. HOLT)
'PERSEUS'	10,109	" "	CHINA MUTUAL S.N.CO LTD. (A. HOLT)
'CITY OF CHICAGO'	7,622	" "	ELLERMAN LINES LTD.
'CITY OF OTTAWA'	7,622	" "	ELLERMAN LINES LTD.
'CINGALESE PRINCE'	8,827	" "	PRINCE LINES LTD.
'EASTERN PRINCE'	8,827	" "	PRINCE LINES LTD.
'CREDO' (TANKER)	16,355	" "	A/S JENSENS REDERI II, ARENDAL.
'OCEAN MONARCH'	13,654	" "	FURNESS BERMUDA LINE. (FURNESS, WITHY)

BARROW-IN-FURNESS

'CHUSAN'	24,215	TONS, GROSS	P & O.S.N. CO.
'EVA PERON'	12,627	" "	INSTITUTO ARGENTINO DEL PROMOCION DEL INTERCAMBIO
'17TH DE OCTUBRE'	12,634	" "	" "
'ORONSAY'	27,632	" "	ORIENT LINE.
'BRITISH ADVENTURE' (TANKER)	18,400	" "	BRITISH TANKER CO. LTD.

Vickers-Armstrongs



Limited

VICKERS HOUSE · BROADWAY · LONDON · SW1

SHIPBUILDERS · ENGINEERS · AIRCRAFT CONSTRUCTORS

BT 155

High Grade Steel Castings & Forgings

for the Three Services

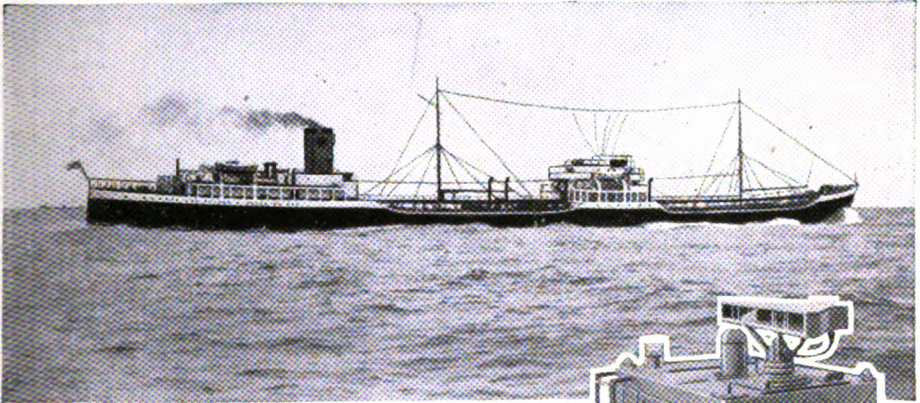
HADFIELDS
OF SHEFFIELD

STEELMAKERS
STEELFOUNDERS
FORGEMASTERS
ENGINEERS

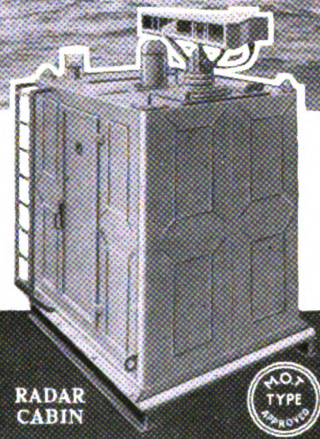
HADFIELDS LTD., EAST HECLA WORKS
SHEFFIELD, ENGLAND



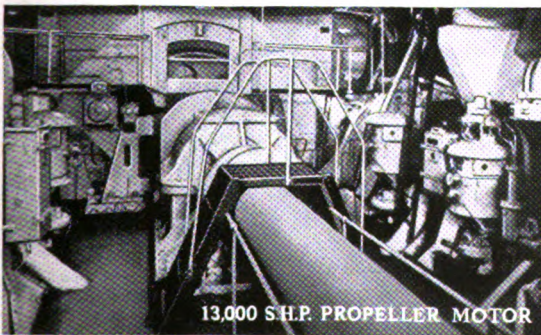
MARINE PROPULSION AND RADAR EQUIPMENT



18,000 tons (d.w.) tanker, T.E.S. 'Hyalina' fitted with BTH turbo-electric propulsion machinery, turbo-generators for auxiliary power supply, and with BTH marine radar equipment. With unrivalled manufacturing resources backed by continual research, BTH enjoys an enviable reputation for the quality



RADAR
CABIN



13,000 S.H.P. PROPELLER MOTOR

and reliability of its products. These include electric equipment for any size or type of ship—ranging from main propulsion to lighting—from auxiliary generating plant to Radar.

THE BRITISH THOMSON-HOUSTON CO. LTD • RUGBY • ENGLAND

Member of the AEI group of companies

A 4225

PARSONS MARINE TURBINES

GEARED



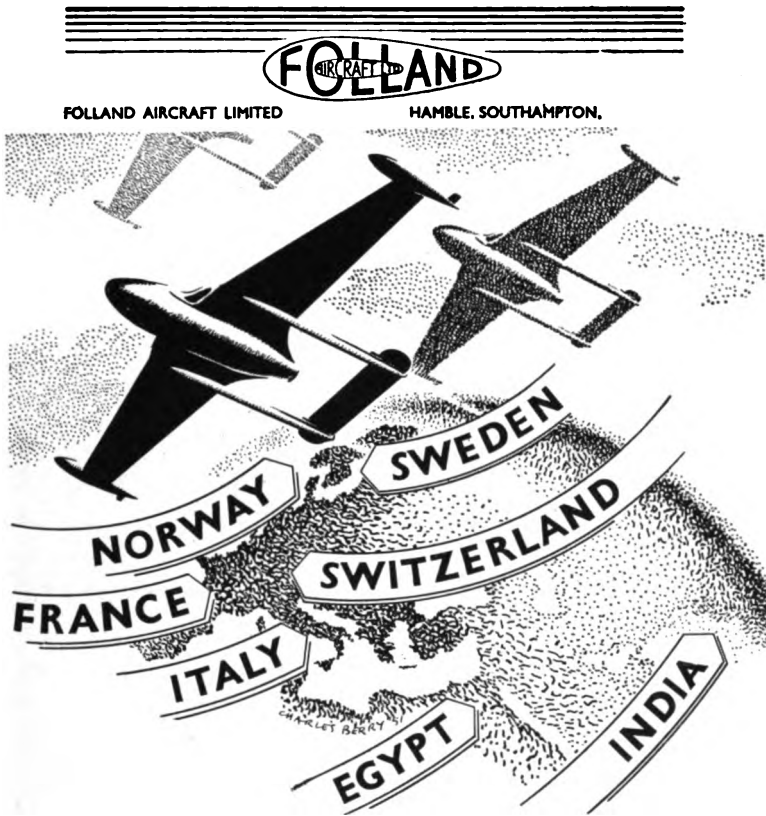
*Intermediate-pressure
Turbine Rotor.*

THE PARSONS MARINE STEAM TURBINE CO. LTD.

TELEGRAPHIC ADDRESS
TURBINIA · WALLSEND

WALLSEND · ON · TYNE

TELEPHONE NUMBER
WALLSEND 63261

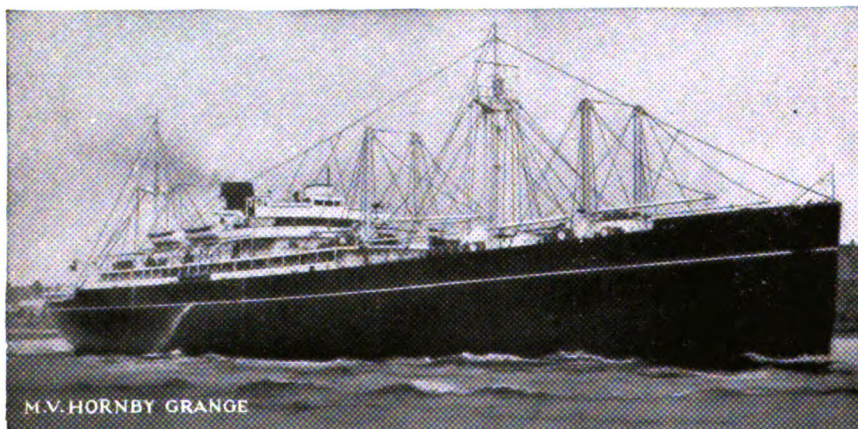


We are staffed from top to bottom with keen and experienced aircraft engineers, and our organisation is trimmed for efficiency. The result is seen in large scale Production of Modern Aircraft Components of high quality and low cost.

FOLLAND AIRCRAFT LTD.
HAMBLE SOUTHAMPTON



Electric Equipment for Marine Service



A.C. Auxiliaries

BTH has unique experience in the development of A.C. machinery for use aboard ship. The 1,780-ton collier "Pompey Power" and her sister ship "Pompey Light" both of which went into service in 1949, were the first British ships of their type to have all auxiliaries, including deck machinery, driven by A.C. motors. Alternators and switchgear were also supplied by BTH.

The 10,800-ton cargo liner M.V. "Hornby Grange" was commissioned in 1946. The complete cold air-circulating fan refrigeration system employs seventy-six BTH A.C. motors taking power from two BTH motor-alternator sets. Similar contracts have now been completed for three further ships—M.V. "Corinaldo", S.S. "Cortona" and S.S. "Duquesa".

BTH manufactures :—
 Turbo-electric propulsion
 Diesel-electric propulsion
 Electric couplings and gears
 for geared diesel drives
 A.C. or D.C. Auxiliary equipment
 Turbo-generator sets
 Oil engine-driven generators
 Motor and control gear
 Mazda lamps and lighting
 equipment



BRITISH THOMSON-HOUSTON

THE BRITISH THOMSON-HOUSTON CO., LTD., RUGBY, ENGLAND

A3967

Member of the AEI group of companies



STRIKING

Large bomb bay carries attack weapons



STRIKING DOWN

Double-fold wings are power folded

FAIREY GANNET

(FAIREY 17)

ARMSTRONG SIDDELEY DOUBLE MAMBA

TWIN-ENGINE • ANTI-SUBMARINE • CARRIER-OPERATED

CHOSEN FOR SERVICE IN THE ROYAL NAVY

FOR MORE THAN 30 YEARS CONSTRUCTORS OF NAVAL AIRCRAFT

THE FAIREY AVIATION CORPORATION LIMITED, LONDON

SWAN, HUNTER, AND WIGHAM RICHARDSON, LTD.

Shipbuilders, Engineers and Repairers

WALLSEND-ON-TYNE

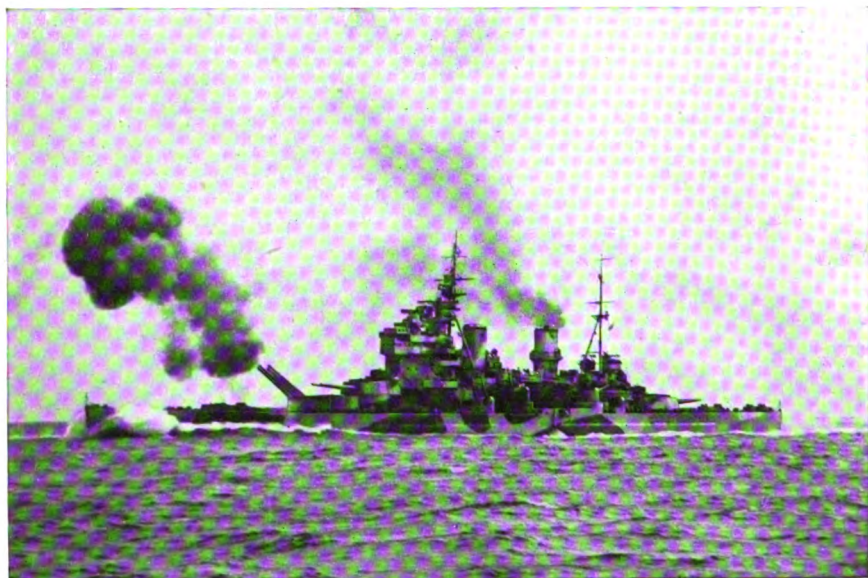
SPECIALISTS IN THE CONSTRUCTION OF

ALL TYPES OF NAVAL SHIPS

FIRST CLASS STEAM AND MOTOR PASSENGER SHIPS

CARGO SHIPS, TRAIN FERRIES, AND OIL TANKERS

FLOATING DOCKS OF ALL TYPES AND SIZES



H.M.S. ANSON

Marine Steam Engines of all Types

Swan, Hunter-Doxford Marine Oil Engines

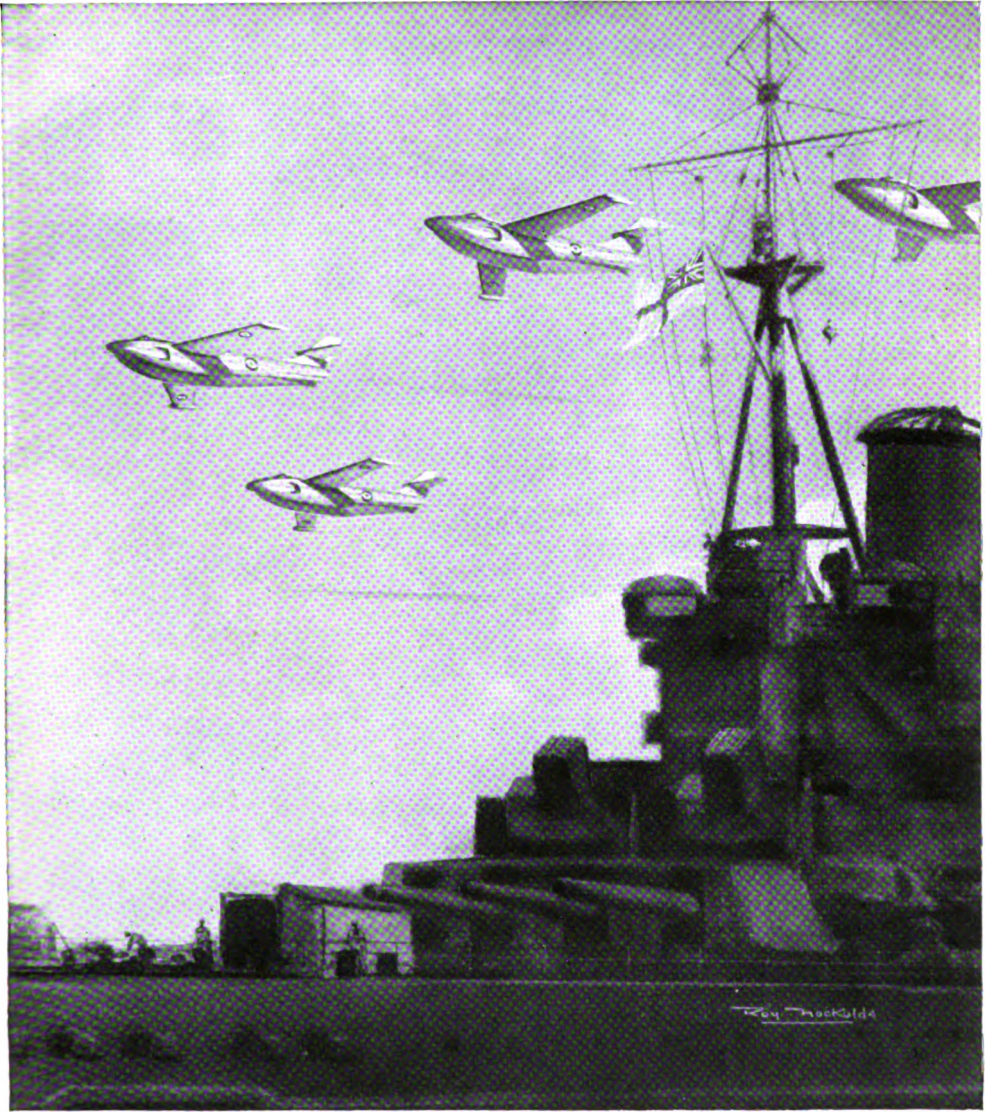
BAUER-WACH EXHAUST TURBINE SYSTEM. TURBO-COMPOUND INSTALLATIONS

BABCOCK & WILCOX WATERTUBE BOILERS.

PRUDHON-CAPUS BOILERS

THREE GRAVING DOCKS up to 570 feet long.

OFFICES IN LONDON : **ARMADORES HOUSE, BURY STREET, E.C.3**



MEN O' WAR

Their medium — our heritage — the sea

Fighter Flying Boats—Flying Boats for all purposes

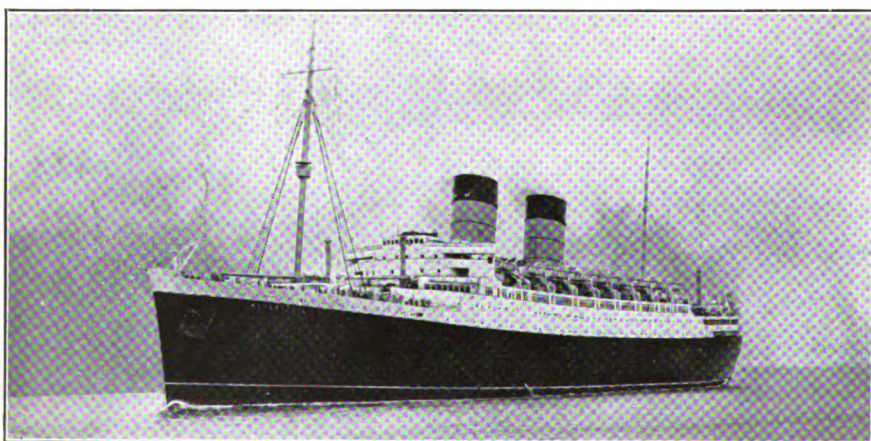
SAUNDERS  **ROE LTD**

WORKS AT :— EAST COWES, ISLE OF WIGHT • EASTLEIGH, SOUTHAMPTON • BEAUMARIS, ANGLESEY

CAMMELL LAIRD AND COMPANY LIMITED

Constructors of all types of Naval and Merchant Vessels from Battleships to Submarines and from Passenger Liners to Tug Boats.

Builders of Engines, Geared Turbines, Boilers and Machinery of all kinds.



Cunard White Star passenger liner "Mauretania"

SHIPBUILDERS, ENGINEERS & SHIP REPAIRERS
SHIPBUILDING & ENGINEERING WORKS
BIRKENHEAD

Communication and Control



Standard Communication & Control Systems

Telephone
Telegraph
Teleprinter
Radio Broadcasting
Radio Communication
Radio Navigation
Sound Reproduction
Remote Control
Remote Indication
Telemetry
Railway Signalling
Railway Control
Power Cable
Communication Cable
Airfield Lighting Control
Street Lighting Control
Fire Alarm
Totalisator
Public Indicator
Signalling (Office and
Factory)

Standard Telephones and Cables Limited

TELECOMMUNICATION ENGINEERS

CONNAUGHT HOUSE, ALDWYCH, LONDON, W.C.2

Cairo Dublin · Johannesburg · Karachi · New Delhi · Salisbury

An aerial
view of
H.M.S. Solebay

Battle Class
Destroyer



**Hawthorn
Leslie**

R. & W. HAWTHORN, LESLIE & CO., LTD.
Shipbuilders . Engine Builders . Marine Boiler Makers
Newcastle upon Tyne

DIVING APPARATUS

*including Self-contained "Frogman" types, Divers'
Loudspeaking Telephones, Underwater Lamps, etc.*

UNDERWATER CUTTING AND WELDING EQUIPMENT

SELF-CONTAINED

OXYGEN BREATHING APPARATUS

for work generally in irrespirable atmospheres

ALSO COMPRESSED AIR TYPES

RESUSCITATING APPARATUS

for the apparently drowned or asphyxiated

SMOKE HELMETS

for Steamships, Oil Tankers, Docks, etc.

Telephone:
Elmbridge 5900.

SIEBE, GORMAN & CO., LTD.
L O N D O N
EVERYTHING FOR SAFETY EVERYWHERE

Telegrams:
Siebe, Surbiton.

TOLWORTH, SURBITON, SURREY

Launched in 1951 by

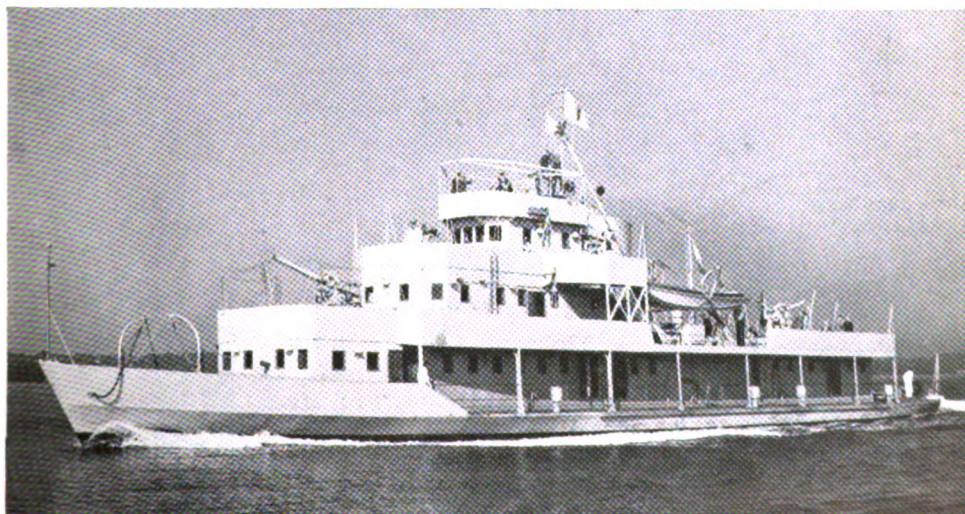
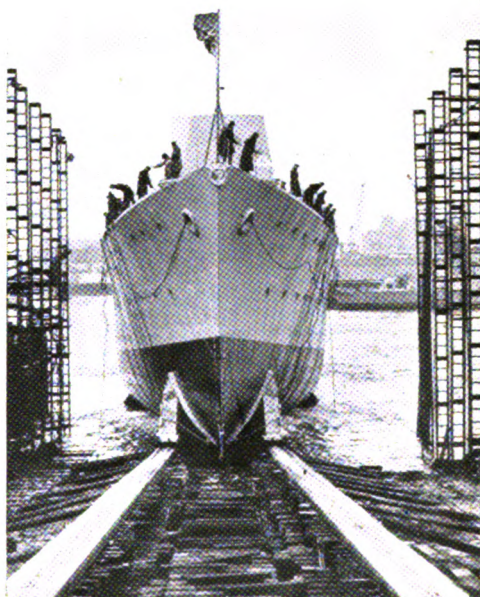
THORNYCROFT

These craft are typical of the hundreds of naval vessels built by us during the last eighty years, comprising: destroyers, mine-layers, minesweepers, motor gun-boats, motor torpedo boats, and the like.

Illustrations show: (right) H.M.S. Duchess, a Daring-class destroyer, launched on 9th April. Length, 390 feet o.a. Beam, 43 feet. Displacement, 2610 tons (3500 tons full load). Armament, Six 4.5 and 6 other guns; (below) B.A.P. Ucayali, one of two 350-ton shallow-draught river gunboats built for the Peruvian Government.

**JOHN I. THORNYCROFT & CO.
LIMITED**

Woolston Works, Southampton



H.M.S. "SCORPION"

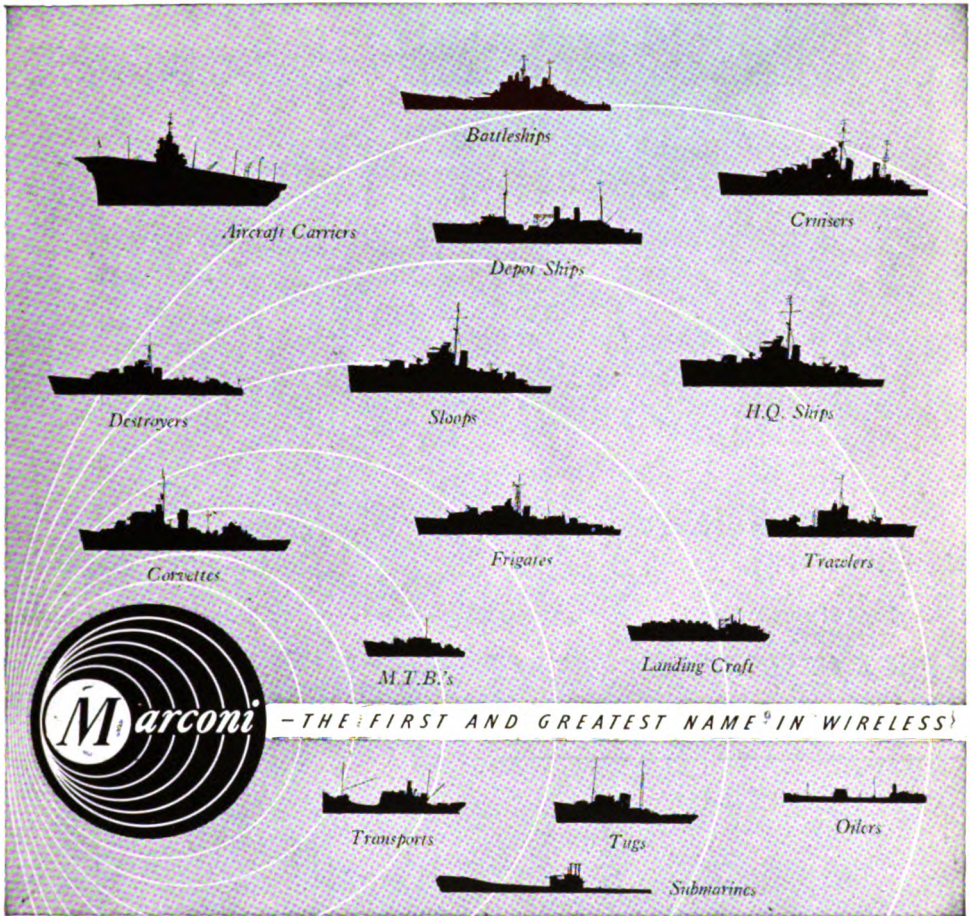


CHOSEN BY THE BRITISH AND MANY FOREIGN NAVIES

The **Brown**
 GYRO COMPASS EQUIPMENTS
 AND AUTOMATIC HELMSMAN

An acknowledged aid to accurate navigation

S · G · BROWN · LTD.
 Shakespeare Street, Watford, Herts
 Telephone: Watford 7241
 Telegrams: Sidbrownix, Watford



Ship-to-ship and ship-to-shore

Marconi Communication Equipment is designed to conform to the most rigid specifications laid down by the British Admiralty. Marconi's Wireless Telegraph Co. who were the pioneers of wireless, have supplied complete radio and radar installations for fighting ships of every class.

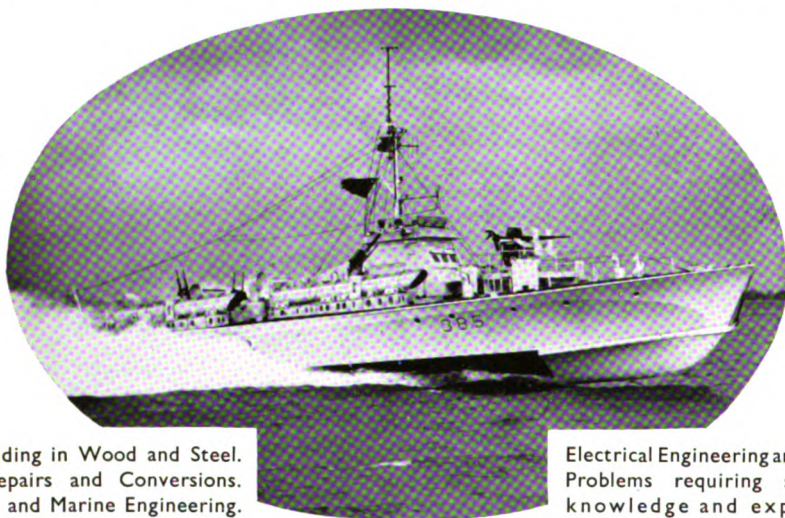
AND EQUIPMENT FOR

SHIP-SHIP AND SHIP-SHORE TELEPHONY
 DISTRESS SIGNAL TRAFFIC
 AIRCRAFT CONTROL AND RADIO COMPASS
 GUNNERY AND WARNING RADAR
 CALIBRATION
 NAVIGATIONAL AIDS
 ECHO SOUNDING

MARCONI'S WIRELESS TELEGRAPH CO. LTD., MARCONI HOUSE, CHELMSFORD, ESSEX

VOSPER

MOTOR TORPEDO BOATS

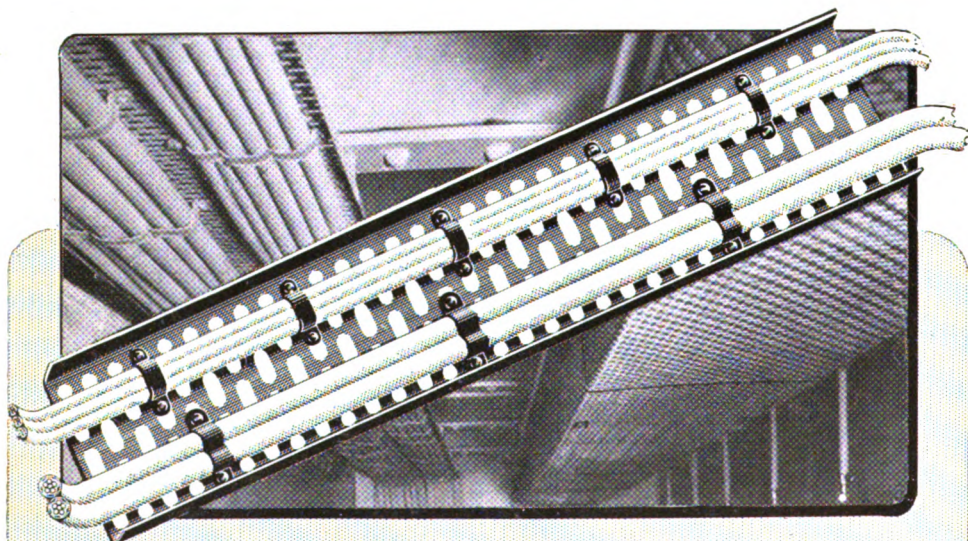


Shipbuilding in Wood and Steel.
Ship Repairs and Conversions.
General and Marine Engineering.

Electrical Engineering and Repairs.
Problems requiring specialised
knowledge and experience.

**CRAFT DESIGNED
FOR
ALL PURPOSES**

OF PORTSMOUTH

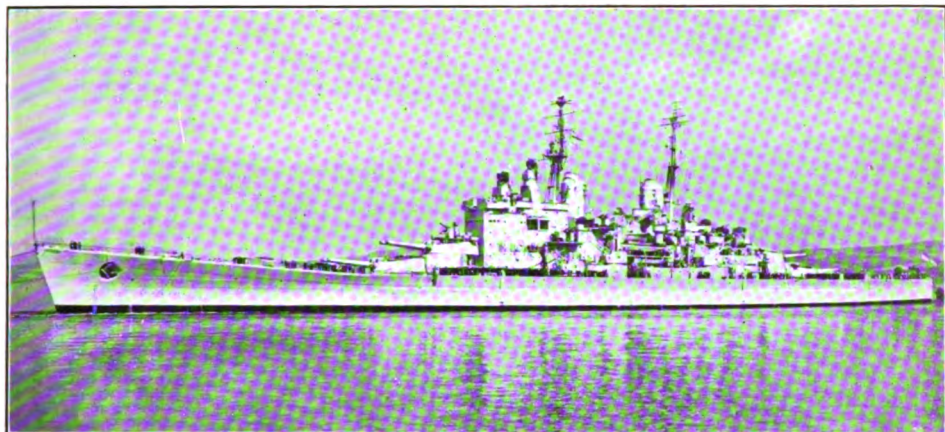


Whenever it is a question of fitting and fixing electric wires and cables—remember Harveys. For their 'Harco' Perforated Mild Steel Cable Plates supply the answer to all wiring problems. They save wiring costs because no drilling is required. Standard widths from 2 in. up to 36 in. Any length up to 10 ft. with bends for all Standard widths. Write for List BN 842.

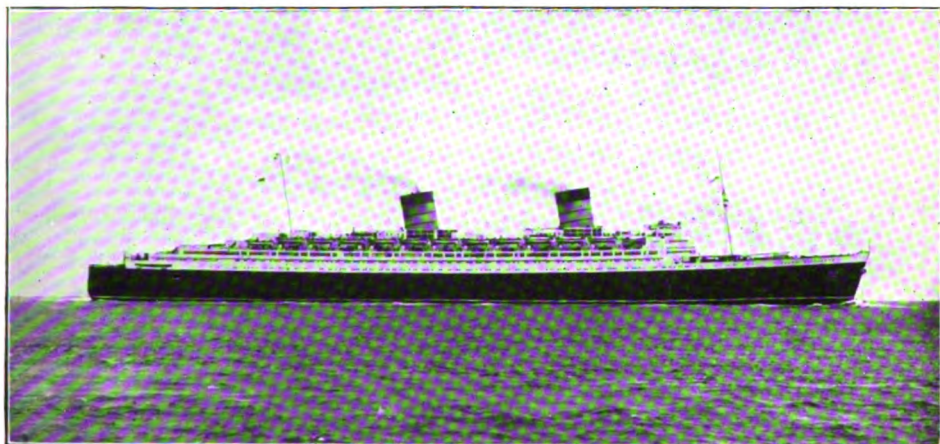
G. A. Harvey & Co. (London) Ltd.

"Harco"

Woolwich Road, London, S.E.7



THE BATTLESHIP "VANGUARD"



The Cunard White Star Liner "QUEEN ELIZABETH"

The Battleship "*Vanguard*" and the Cunard White Star Liner "*Queen Elizabeth*" were both constructed and engined by

JOHN BROWN & COMPANY LIMITED

Their extensive works at Clydebank are particularly well equipped for the construction and engining of Passenger and Cargo Vessels up to the largest size and power, also Channel Steamers and Yachts.

Clydebank Engineering & Shipbuilding Works **CLYDEBANK, Nr. GLASGOW**

London Office : 8, The Sanctuary, Westminster, S.W.1.

INDEX TO ADVERTISERS

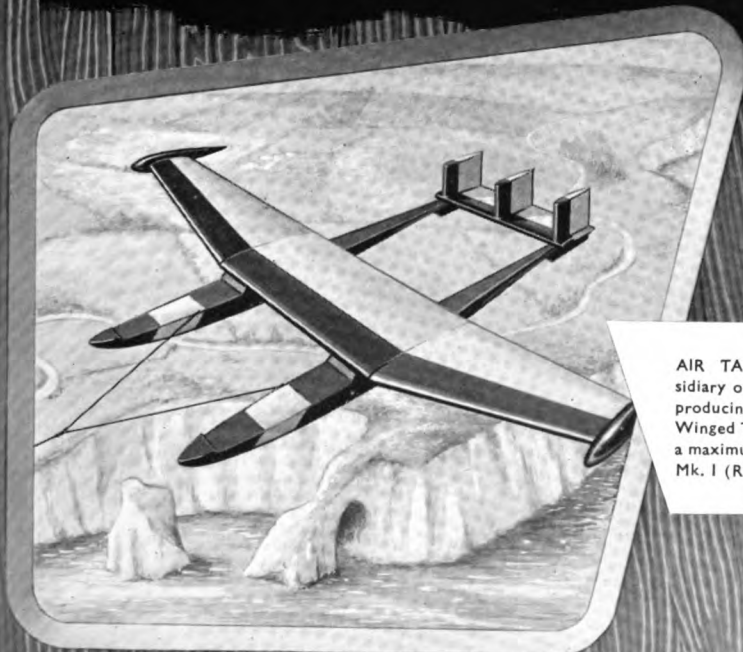
	PAGE
BARR AND STROUD, LTD. 	xxix
BLACKBURN AND GENERAL AIRCRAFT, LTD. 	viii
BRITISH THOMSON-HOUSTON CO., LTD., THE 	xi, xiv
BROWN & CO., LTD., JOHN 	xxv
BROWN, LTD., S. G. 	xxii
CAMMELL LAIRD & CO., LTD... 	xviii
CLOWES & SONS, LTD., WILLIAM 	xxx
FAIREY AVIATION CO., LTD., THE 	xv
FOLLAND AIRCRAFT, LTD. 	xiii
HADFIELDS, LTD. 	x
HARLAND & WOLFF, LTD. 	iii
HARVEY & CO. (LONDON), LTD., G. A. 	xxiv
HAWTHORN, LESLIE & CO., LTD., R. & W. 	xx
MARCONI'S WIRELESS TELEGRAPH CO., LTD... 	xxiii
PARSONS MARINE STEAM TURBINE CO., LTD., THE 	xii
POWER HOUSE COMPONENTS, LTD. 	v
R.F.D. Co., LTD. 	xxvii
ROLLS-ROYCE LTD. 	i
SAUNDERS-ROE, LTD. 	xvii
SHORT BROS. & HARLAND, LTD. 	vi
SIEBE, GORMAN & Co., LTD. 	xx
STANDARD TELEPHONES AND CABLES, LTD. 	xix
SWAN, HUNTER, AND WIGHAM RICHARDSON, LTD. 	xvi
THORNYCROFT & Co., LTD., JOHN I. 	xxi
VICKERS-ARMSTRONGS LTD. (AIRCRAFT DIVISION) 	ii
VICKERS-ARMSTRONGS LTD. 	ix
VOSPER, LTD. 	xxiv
WALLSEND SLIPWAY AND ENGINEERING Co. LTD., THE 	iv
WHITE & Co., LTD., J. SAMUEL 	xxii
YARROW & Co., LTD. 	vii

The R.F.D. 20 seat Universal Life Raft can be valise stowed for hand launching from the rear door. Survivors have flotation and automatically erected weather protection within 15 seconds.



R.F.D.
COMPANY LTD

Survival and Training Equipment

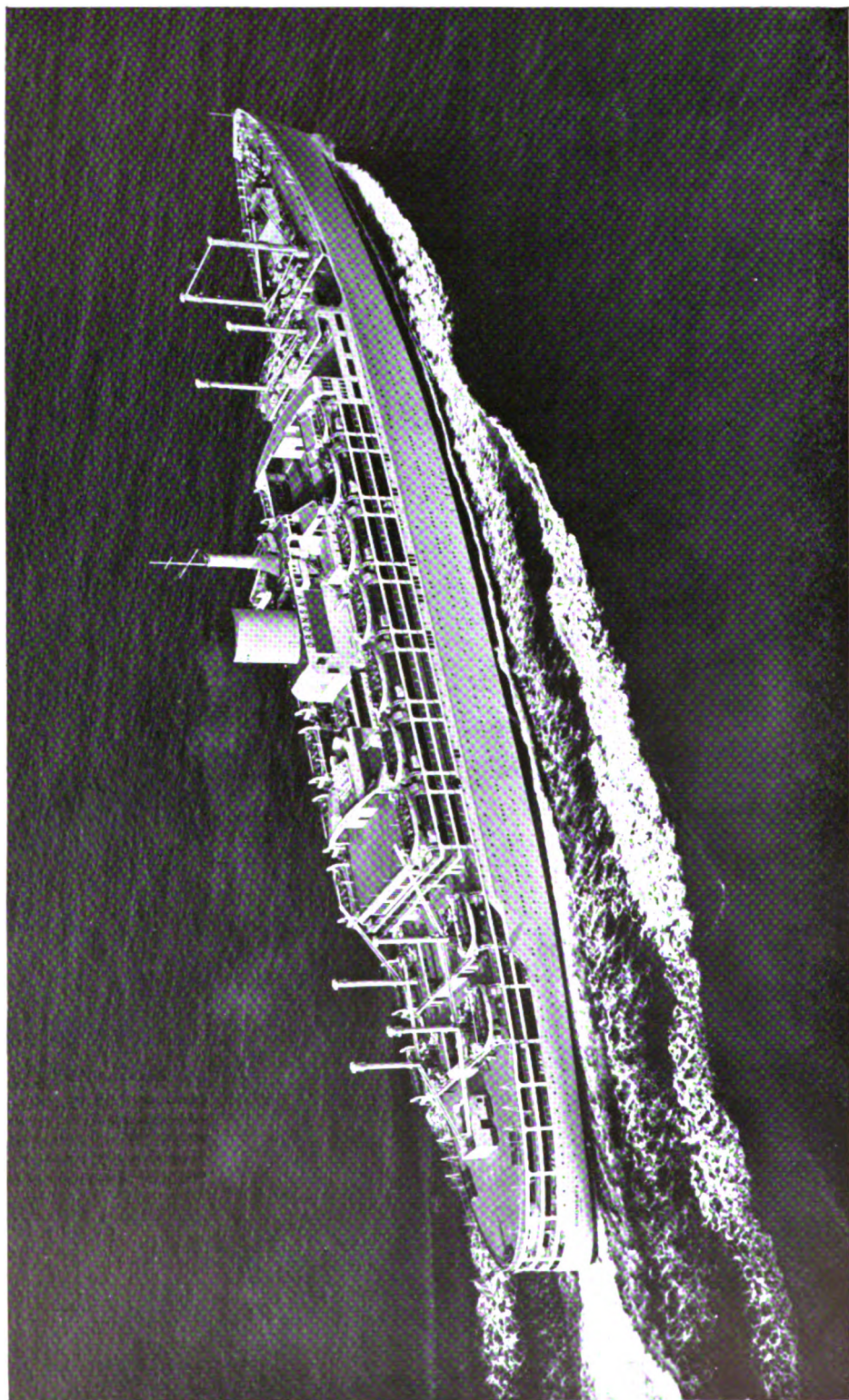


AIR TARGET LTD., a subsidiary of R.F.D. Co. Ltd., are producing their Mk. I 26' span Winged Target. This type has a maximum of 259 knots A.S.I. Mk. I (R) is radar responsive.

The R.F.D. Co. Ltd. GODALMING, SURREY, ENGLAND

A.I. APPROVED

Digitized by Google



T.S.S. Oronsay (28,200 tons) built by Vickers-Armstrongs Ltd., for the Orient Steam Navigation Company

BRASSEY'S ANNUAL

THE ARMED FORCES YEAR-BOOK

1951

Edited by
REAR-ADMIRAL H. G. THURSFIELD

SIXTY-SECOND YEAR OF PUBLICATION

WILLIAM CLOWES & SONS, LIMITED
LONDON
THE MACMILLAN COMPANY
NEW YORK

**MADE AND PRINTED IN GREAT BRITAIN
BY WILLIAM CLOWES AND SONS, LIMITED
LONDON AND BECCLES**

V10
N3
1951

CONTENTS

	PAGE
PREFACE <i>Rear-Admiral H. G. Thursfield</i>	ix
CHAPTER I	
THE STRUCTURE OF DEFENCE <i>Air Vice-Marshal W. M. Yool, C.B., C.B.E.</i>	1
CHAPTER II	
THE SERVICES IN 1950-51 <i>Major-General D. A. L. Wade, C.B.</i>	10
CHAPTER III	
WESTERN DEFENCE .. <i>Colonel the Hon. E. H. Wyndham, M.C.</i>	55
CHAPTER IV	
SOVIET AND WESTERN STRATEGY <i>Jules Menken</i>	63
CHAPTER V	
SOUTH-EAST ASIA IN THE MELTING POT .. <i>R. Goold-Adams</i>	86
CHAPTER VI	
THE KOREAN SCENE <i>Louis Heren</i>	97
CHAPTER VII	
THE INFLUENCE OF SCIENCE ON STRATEGY <i>Sir Henry T. Tizard, G.C.B., A.F.C., F.R.S.</i>	112
CHAPTER VIII	
COMMONWEALTH CO-OPERATION IN DEFENCE <i>Brigadier C. N. Barclay, C.B.E., D.S.O.</i>	116
CHAPTER IX	
CHINESE ARMED FORCES <i>Richard Harris</i>	123
CHAPTER X	
THE PATTERN OF FUTURE WAR <i>Major General J. F. C. Fuller, C.B., C.B.E., D.S.O.</i>	130

NAVY SECTION

PAGE

CHAPTER XI

THE ROYAL NAVY—ORGANISATION AND ADMINISTRATION

Lieutenant-Commander P. K. Kemp, R.N. 140

CHAPTER XII

FOREIGN NAVIES

Lieutenant-Commander P. K. Kemp, R.N. 148

CHAPTER XIII

COMBINED OPERATIONS—BLACK ART OR COMMON PRACTICE ?

Captain J. R. Grindle, R.N. 164

CHAPTER XIV

THE STRATEGIC ROLE OF NAVAL SURFACE AND AIR FORCES

" Volage " 172

CHAPTER XV

THE ENTRY AND TRAINING OF NAVAL OFFICERS .. *" Mentor "* 181

CHAPTER XVI

THE POTENTIAL MENACE OF THE SEA MINE

Captain J. S. Cowie, C.B.E., R.N. 194

CHAPTER XVII

CONDITIONS OF SERVICE IN THE ROYAL NAVY

Lieutenant-Commander Nowell Hall, R.N.V.R. 201

ARMY SECTION

CHAPTER XVIII

THE ARMY SEEN FROM PARLIAMENT

Brigadier A. R. W. Low, C.B.E., D.S.O., M.P. 209

CHAPTER XIX

THE IMPERIAL ARMY

Brigadier C. N. Barclay, C.B.E., D.S.O. 226

CHAPTER XX

KOREA—SOME TACTICAL LESSONS

Lieutenant-General H. G. Martin, C.B., D.S.O., O.B.E. 233

CONTENTS

v

PAGE

CHAPTER XXI

PRINCIPAL FOREIGN ARMIES

Lieutenant-General H. G. Martin, C.B., D.S.O., O.B.E. 250

CHAPTER XXII

CONDITIONS OF SERVICE IN THE ARMY

PART I. *Brigadier E. K. G. Sixsmith, C.B., C.B.E.* 271

PART II. *Brigadier H. M. Liardet, C.B.E., D.S.O.* 279

CHAPTER XXIII

ARMY TRAINING AND MILITARY SCHOOL INSTRUCTION “*Iter*” 286

CHAPTER XXIV

TANK WARFARE—AND ITS FUTURE *Captain B. H. Liddell-Hart* 301

AIR FORCE SECTION

CHAPTER XXV

THE R.A.F. ORGANISATION AND ROLE

Air Vice-Marshal W. M. Yool, C.B., C.B.E. 312

CHAPTER XXVI

COMMONWEALTH AIR FORCES

Air Vice-Marshal W. M. Yool, C.B., C.B.E. 322

CHAPTER XXVII

FOREIGN AIR FORCES *H. F. King* 331

CHAPTER XXVIII

OPERATIONAL TRAINING IN THE R.A.F., 1950 .. “*Ajax*” 343

CHAPTER XXIX

MANNING THE ROYAL AIR FORCE *E. Colston Shepherd* 356

CHAPTER XXX

AIRCRAFT DEVELOPMENT

Group Captain G. W. Williamson, O.B.E., M.C. 365

CHAPTER XXXI

AIR LESSONS FROM KOREA

Air Vice-Marshal W. M. Yool, C.B., C.B.E. 397

REFERENCE SECTION

	PAGE
WHITE PAPER ON DEFENCE	405
ABSTRACT OF NAVY ESTIMATES	411
ABSTRACT OF ARMY ESTIMATES	425
ABSTRACT OF AIR ESTIMATES	434
THE NORTH ATLANTIC TREATY ORGANISATION	442
BRITISH AND FOREIGN ARMED FORCES	452

LIST OF ILLUSTRATIONS

T.S.S. Oronsay	FRONTISPIECE
U.S.S. Missouri (The Mighty "Mo") docking at Long Beach Naval Base, Los Angeles, on her return from Korea	TO FACE PAGE 22
Gun Team in Action with the British Army's largest gun—the 240 mm.	" " 23
An Air Drop in Korea	" " 54
An Air Drop in Korea	" " 55
Vickers 660 4-engined Jet Bomber	" " 70
Fairey Delta (FD1) Research Aircraft	" " 71
Bell XI Experimental Rocket Plane for supersonic research	" " 71
Boeing L.15A Air Observation Post Aircraft	" " 86
Loading Ramp of Chase XC-123	" " 86
Boulton Paul P-111 Experimental Delta Jet Aircraft	" " 87
Glenn Martin KDM-1 Plover. (Radio-controlled target with 20-in. Marquardt Ramjet)	" " 87
AJ1 Bomber landing on Aircraft Carrier	" " 118
Helicopter landing on Naval Supply Ship	" " 118
The American two-man tank destroyer—the Bazooka	" " 119
American 155-mm. Howitzer, with its team, in action in Korea	" " 150
U.S.S. New Jersey recommissions at New York	" " 151
Fairchild XC-120 Pack Plane	" " 182
Canadian Sabre (F.86)	" " 183
Supermarine Type 535 Jet Fighter	" " 183
Convair XP5Y-1 Flying Boat	" " 198
Saunders Roe SR/A1 Flying Boat (jet fighter)	" " 198
Piasecki PV-3 8-seat Helicopter of U.S. Navy	" " 199
British Centurion Tank in Korea—winter 1950-51	" " 214
Boeing B.47 (the Atom Bomber). Take-off with rocket assistance	" " 215
Fairchild C.119 Packet Cargo and Troop Transport Aircraft	" " 215
Explosion of Napalm Bomb	" " 246
North American Aviation RB-45C.4 Jet Bomber for photo reconnaissance duties	" " 246
British Soldier (Royal Engineers) with Mine Detector	" " 247

PREFACE

A WORD of explanation and apology from the Senior Editor seems to be called for. In 1951, for the first time in the fourteen years during which I have filled that office, I have failed to contribute the opening chapter. That omission was due to circumstances over which I had no control. The Editors had completed their preliminary discussions on the structure of the new issue, had issued invitations—which had been accepted—to various distinguished writers to become contributors, and had decided on the subjects and contents of editorial articles, when I was disabled by sudden illness from carrying out my own further part in these arrangements within the inexorable time limits set by the printing and binding programme. Fortunately, that personal mishap caused no interruption in the due production of “Brassey’s Annual.” Air Vice-Marshal W. M. Yool kindly stepped into my shoes as author of the introductory chapter, of which we had already discussed the framework; Brigadier C. N. Barclay and he shouldered my share of the editorial work as well as their own, and made arrangements for the other contributions which it had been intended that I should supply. I should wish here to record the gratitude of an invalid who, prevented from performing the task he had undertaken, was saved all anxiety by the knowledge that he left it in the hands of able colleagues.

H. G. THURSFIELD

CHAPTER I

THE STRUCTURE OF DEFENCE

IN THIS Festival of Britain year, in which the progress made in so many fields of activity during the past hundred years is being reviewed, it is perhaps appropriate that the opening chapter should attempt to outline the main developments that have taken place in the defence structure since the Great Exhibition was held in 1851.

Probably the development that has most influenced the direction of war was the invention of the electric telegraph. First used in the Crimean war, from then on commanders in the field have been increasingly subjected to closer and closer control from above; no longer, once away from the homeland, were they a law unto themselves and free from interference for weeks or months at a time. It was significant, as foreshadowing the influences likely to be brought to bear on a commander in the future, that one of the earliest messages received by the Commander-in-Chief in the Crimea, and which he was roused from sleep to read, was the cryptic message, "Take care of Dowb." Research revealed that this referred to a young officer on the staff called Dowbigging, and that the message had resulted from the anxious solicitude of a mother with some political influence. Possibly Haig had Dowb in mind when he was so insistent on being undisturbed when asleep.

The subsequent development of the child of the electric telegraph, wireless, brought the Naval commander also under similar control, and the advent of the aircraft, with the consequent ease with which the personal touch can be maintained, have all helped to make the business of modern warfare, as indeed of life in general, immensely more complicated. Then on top of this there has been the gradual growth of the scale of warfare from affairs only of the Armies and Navies to the total war of our own day in which the whole life of the people is involved, and in which wars can no longer be fought on a purely national scale but have become international. No longer can the defences of a country be based on its own requirements only, or be self sufficient without the assistance of allies.

This process first started in the 1914-18 war. Before then we had adopted the two-power standard for capital ships, under which our Navy was equal to the combined fleets of any two major powers, and at the same time we maintained sufficient cruisers to ensure control of the waters of the world. The Army, organised on the Cardwell system, under which there was one battalion abroad for every one at home, was similarly designed to be sufficient to meet our own needs throughout the Empire. At the same time co-operation between the Services was virtually non-existent, and the Admiralty was even unaware before the outbreak of war in 1914 that the War Office was planning to send an expeditionary force to the Continent.

But once the 1914-18 war had started it soon became obvious that we were faced with an entirely new type of warfare, and on a scale far greater

than anything that had previously been envisaged. The Navy, in spite of the menace of the submarine campaign, on the whole proved equal to its responsibilities; but the Army, although the quality was unsurpassed, bore no relation in size to the numbers required. By the end of the war in 1918 we had built up a vast Army but one which by itself was quite inadequate to defeat the might of Germany. Only in alliance with the much bigger Armies of France and the United States was victory possible. Then towards the end of the war came the greatest change of all in our outlook, when, as the result of the pressure of events, we reluctantly agreed to the appointment of Marshal Foch as Generalissimo of the Allied Armies. The writing was indeed on the wall, though we were still a long way from being able to read it.

At the same time the advent of the Air Force added enormously to the complexity of modern warfare. Aircraft, which had been regarded originally solely as auxiliaries to the other two Services, by 1918 had already become such an important factor that the Royal Air Force was formed on April 1, 1918, as a separate Service, in spite of the difficulty of effecting such a major administrative change in the midst of a war.

The main lesson of the 1914-18 war, namely, the need for international collaboration in the field of defence, went largely unheeded between the wars, and it was only a short time before the outbreak of war in 1939 that we decided to send an expeditionary force to the Continent in the event of war. By the time war actually broke out, however, we had evolved a satisfactory system of co-operation with the French, we had also agreed to our expeditionary force being placed under French command, and Naval, Military and Air missions actually went to France in advance of the outbreak of war, so some progress in the international field had been made.

Within the Empire measures for the co-ordination of defence had progressed more satisfactorily as a result of the formation of the Committee of Imperial Defence, which was originally set up in 1912. Although purely an advisory body, it did at least ensure that the defence plans of the Dominions were co-ordinated with those of the United Kingdom.

Between the wars there was much discussion from time to time on the advisability of setting up a Ministry of Defence to co-ordinate the activities of the three Services, but the Ministry was not actually formed until after the war, on January 1, 1947. Instead, a Minister for the Co-ordination of Defence was appointed in 1936, but it is doubtful whether this post, which carried no executive responsibility, was ever justified, and it disappeared when Mr. Churchill became Prime Minister in 1940 and assumed at the same time the title of Minister of Defence.

Doubts are often expressed as to whether a Minister of Defence is necessary, as it seems certain that in war, in view of the fact that the whole national effort is involved, this post would inevitably have again to be assumed by the Prime Minister. Whilst there may not have been any very strong case before for having a Minister of Defence in peace time, it does seem necessary to have such a post to-day, when so many of our defence problems are international and have to be dealt with on a ministerial level. Obviously the ideal would be for the post to be filled in peace as well as in war by the Prime Minister, but this would appear to be impracticable in peace-time, when there are so many other calls upon

his time, and only justified when our defence needs become paramount. There is also an advantage in having a similar system to that of most of our Allies for the control of defence. All the countries of the Commonwealth and all the major signatories to the Atlantic Treaty have adopted the Ministry of Defence system, and this does undoubtedly facilitate discussion.

DEFENCE

The Chiefs of Staff Committee dates back to the days of the 1914-18 war, and has continued to function ever since. There is no doubt that this body, although it has no executive functions as such, has proved to be an extremely efficient instrument for the conduct of war. It stood the test of the 1939-45 war, it has been widely adopted in other countries, and it provided the model for the Combined Chiefs of Staff which so successfully co-ordinated the operations of the American forces and our own during the war. But the Chiefs of Staff Committee was only responsible for our own forces. It had no responsibility for the forces of the Dominions, which came under the Committee of Imperial Defence, and still less had it any responsibilities in the international sphere.

This responsibility rested, in theory at any rate, with the ill-starred League of Nations. Foredoomed to failure from its inception, when the United States refused to ratify the Treaty, its existence only served to bedevil our defence planning, as the politicians, on the grounds that collective security was provided by the League, were able to withhold from the Services a large part of the funds essential for the efficient development. The abortive disarmament conferences similarly helped the Government of the day to continue starving the Services, and it was not until the Italian aggression in Abyssinia and the Japanese invasion of Manchuria that the complete ineffectiveness of collective security as then conceived was exposed, and the Government saw the red light. As these acts of aggression coincided with the rise of Hitler the tempo of rearmament gradually increased from 1936 onwards, and by the outbreak of war in 1939 a good deal of the leeway had fortunately been made good.

During the war the functioning of the Chiefs of Staff Committee under the direction of Mr. Churchill furnished us with an instrument for the higher direction of war, which could not be bettered. The following quotation describes how the organisation worked:

• The fundamental changes in the machinery of war direction were more real than apparent. "A constitution," said Napoleon, "should be short and obscure." The existing organisms remained intact. No official personalities were changed. The War Cabinet and the Chiefs of Staff Committee at first continued to meet every day as they had done before. In calling myself, with the King's approval, Minister of Defence I had made no legal or constitutional change. I had been careful not to define my rights or duties. I asked for no special powers either from the Crown or Parliament. It was, however, understood and accepted that I should assume the general direction of the war, subject to the support of the War Cabinet and the House of Commons. The key-change which occurred on my taking over was, of course, the supervision and direction of the Chiefs of Staff Committee by a Minister of Defence with undefined powers. As this Minister was also the Prime Minister, he had all the rights inherent in that office, including very wide

• "Their Finest Hour," Winston S. Churchill.

powers of selection and removal of all professional and political personages. Thus for the first time the Chiefs of Staff Committee assumed its due and proper place in direct daily contact with the executive head of the Government, and in accord with him had full control over the conduct of the war and the armed forces.

In January 1942, following the entry of the United States into the war, the Combined Chiefs of Staff Committee was set up, and continued to function throughout the war. Like the Chiefs of Staff Committee on the national level, the Combined Committee seemed to provide the ideal machinery on the international level.

• It may well be thought by future historians that the most valuable and lasting result of our first Washington conference—"Arcadia," as it was code named—was the setting up of the now famous "Combined Chiefs of Staff Committee." Its headquarters were in Washington, but since the British Chiefs of Staff had to live close to their own Government they were represented by high officers stationed there permanently. These representatives were in daily, indeed hourly, touch with London, and were thus able to state and explain the views of the British Chiefs of Staff to their United States colleagues on any and every war problem at any time of the day or night. The frequent conferences that were held in various parts of the world—Casablanca, Washington, Quebec, Teheran, Cairo, Malta, and the Crimea—brought the principals themselves together for sometimes as much as a fortnight. Of the two hundred formal meetings held by the Combined Chiefs of Staff Committee during the war no fewer than eighty-nine were at these conferences; and it was at these full-dress meetings that the majority of the most important decisions were taken.

But the Combined Chiefs of Staff Committee was confined to ourselves and the Americans. It did not include the Russians, and it is doubtful whether it is suited to the changed conditions of to-day, when the activities of the forces of twelve countries have to be co-ordinated under the North Atlantic Treaty.

What is clear is that we have moved a very long way from the self-sufficiency of the pre-1914 era, when the British Navy was predominant on the waters of the world, and the Army organised solely with regard to our own needs. To-day, for better or worse, our fortunes are inextricably linked with those of our fellow signatories to the Atlantic Treaty, and we can no longer, in the words of Mahan, take as much or little of the war as we will.

To-day the defence requirements of this country fall under four main heads, namely, the defence of the United Kingdom, the safeguarding of the sea routes on which we are dependent for our supplies, our contribution to the defence of Western Europe under the Brussels and Atlantic Treaties, and the protection of our interests overseas. All these commitments are to some extent complementary, but they cover such a wide field that there is a definite danger that we may dissipate our resources by attempting too much.

If, however, we adopted an isolationist policy and concentrated our resources upon the defence of the United Kingdom and on controlling the sea communications, we should still be vulnerable to attacks from rockets and guided weapons, which, should Western Europe be overrun, could be launched from sites immediately adjacent to our shores. It is

• "The Grand Alliance," Winston S. Churchill.

therefore almost as important, apart from our Treaty obligations, to prevent Europe being overrun as it is to defend our own shores. Obviously we cannot do this unaided, and we have therefore to rely largely for our defence upon the assistance of other countries.

From this it follows that we have accepted the principle that our security is linked indissolubly with that of the other signatories to the Atlantic Treaty, but it is doubtful whether we are yet fully agreeable to adopting this principle in practice. When the Prime Minister announced in the House of Commons on January 29, 1951, that the total cost of our accelerated defence programme would amount to £4,700 millions during the next three years, it was obvious that expenditure on this scale was going profoundly to affect our standard of living and way of life. No one, other than a few dissident left wingers, seriously questions the need for expenditure on this scale, but it is only by a complete pooling of the resources of all the signatories to the Treaty that we can ensure that this vast sum is expended to the best possible advantage.

When the North Atlantic Treaty was originally under discussion in the Foreign Affairs Committee of the House of Representatives during the summer of 1949, the American Joint Chiefs of Staff made it clear that American strategy under the Treaty was based on the assumption that a unified system of Command and division of responsibility for defence would be agreed to by the Western Union countries. Since then, following the meeting of the Council of the Treaty powers in Washington in September 1950, a unified command has been agreed and General Eisenhower has been appointed Supreme Commander, but so far no clear picture has emerged of how the responsibility for defence is going to be divided amongst the signatories so as to avoid waste and overlapping.

The original defence plan agreed by the Council at the Hague in April 1950 envisaged that responsibility in the early stages of a war would rest primarily with France for the provision of land forces; with the Western Union and American Navies for the security of the sea communications; with Great Britain and France for tactical air forces and air defence; and with America for strategic bombing, as the atom and hydrogen bombs were regarded as the main war-winning weapons. Since then events in Korea have driven home the lesson that strong forces will be required on the ground if Europe is not to be overrun in the early stages before strategic bombing can become effective. The plan has therefore had to be modified, and the ground forces considerably strengthened, since a figure of fifty divisions has been mentioned as the minimum required.

Misgiving on this point had already been voiced in the French memorandum submitted, in common with the other Treaty powers, to the United States in the summer of 1950, which brought out clearly the point that any attempt at rearmament would be useless if sufficient forces were not stationed in Europe to maintain peace. The memorandum went on to point out that although France proposes to increase her forces by fifteen divisions in the next three years, the total forces required could not be found by the Continental countries alone, and that "it is necessary for the United States and Great Britain to share in the defence by stationing a sufficient number of divisions on the Continent."

Following General Eisenhower's tour of Europe after his appointment and his report to Congress, the strengthening of the American Army in

Europe was agreed, in spite of some opposition from the more isolationist sections in the United States, and we are similarly strengthening our ground forces as part of our contribution to the defence of Europe. In the first instance the American contingent is being raised to six divisions from the present two and the British from three to four.

The French also suggested the pooling of the military and financial resources of the Atlantic Treaty countries. This was certainly logical, but went considerably further than the United States, Canada or ourselves were prepared to accept. As a result France evolved the Pleven plan for a European Army, to include a German contingent, which would be administered and supplied by a European Defence Minister, responsible to a European Council of Ministers and an Assembly, and financed from a common budget. This plan is still being discussed, and, whilst it may be eventually agreed in principle, it will almost certainly be considerably modified in detail.

It does seem, however, that, whether or not the contribution of the Continental countries is in the shape of a European Army or separate contingents, the forces provided by each country must be those required to fit into a co-ordinated defence system, even though this means that some countries would be without some specific element of defence, essential to the balanced forces necessary if they had to wage war on their own. Admittedly this means that a country has to be prepared to abrogate its sovereignty to some extent, and to rely upon the other signatories, and, in particular, the United States, fulfilling punctually their obligations under the Treaty. (The North Atlantic Treaty only binds the signatories to take such action as they deem necessary, and not necessarily to provide armed assistance to any country attacked.)

Unless the principle of pooled forces is accepted there is bound to be considerable duplication and waste of effort. The combined Naval forces of France, Great Britain, and the United States, for instance, are surely greatly in excess of what would be required in a war against Russia, which cannot be classed as a great Naval power whatever the extent of the submarine threat may be. The total number of capital ships, in particular, seems much in excess of requirements, and the provision of aircraft carriers by the French an unnecessary extravagance. There may also be some duplication of strategic bombers, to the detriment of more essential requirements, bearing in mind that the Allied stock of atom bombs is held by the United States, who presumably will be responsible for long-range strategic bombing.

So far we have had no very clear indication of what is going to be done to ensure that the vast expenditure on defence during the next three years is going to be put to the best possible use. In the Prime Minister's original statement he announced that by 1953-54 the production of tanks and combat aircraft would have been quadrupled, and that the programme for building and converting ships to deal with the submarine and mining threat would be greatly accelerated, but there was no mention then or since of the necessity to fit our defence measures into a co-ordinated plan if we are to obtain the best results for the expenditure involved.

If war should come the atom bomb may prove the war-winning weapon, but we cannot rely upon it, and the first essential in a co-ordinated defence system is to ensure that Europe will not be overrun in the early stages

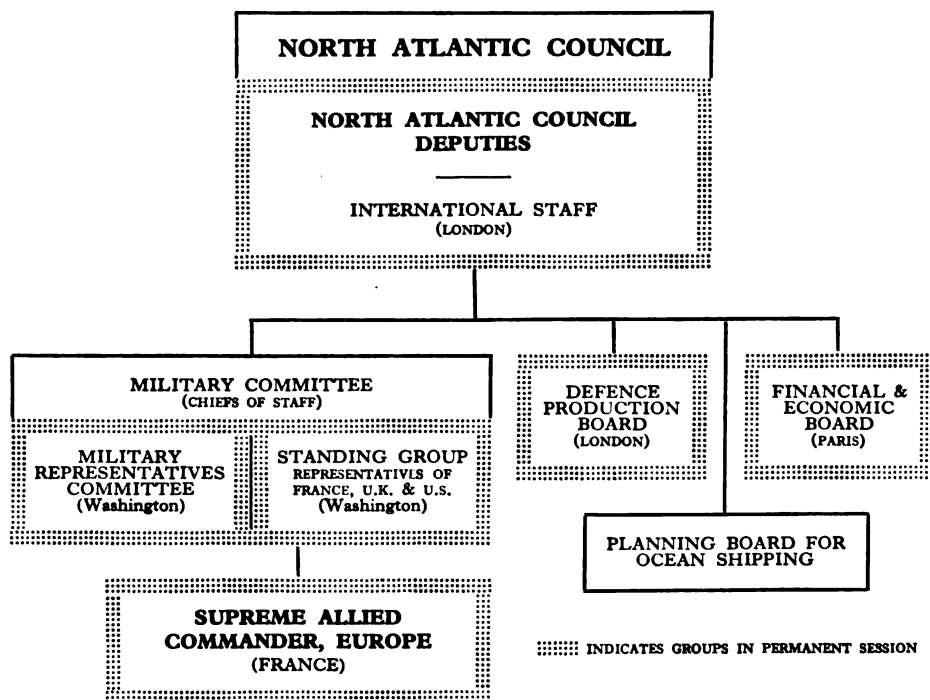
before strategic bombing can become effective. We must therefore contribute something towards the ground forces necessary for this, and the four divisions it is proposed to station in Germany, out of a total of ten Regular divisions, is probably as many as we can provide at the moment in view of our other commitments. At the same time, in order to ensure that adequate air support is available for our ground forces, our tactical air forces require strengthening, and this is more important than the provision of strategic bombers by this country, in view of the preponderating strength of the United States in this arm.

At the same time we have to ensure the defence of this country from air attack, and to this end first priority in defence is being given to the expansion of Fighter Command. The security of the sea communications is of equal importance, and measures are being taken to increase the number of frigates, minesweepers, and small craft, to deal with the submarine and mining threat; but we do not require, and cannot afford, to maintain any capital ships in commission.

The value of the measures being taken to strengthen our defences cannot be adequately assessed, however, unless they are related to the contributions being made by the other signatories to the Atlantic Treaty. What is required is a complete plan showing the total forces necessary to implement the Treaty, with a detailed breakdown showing the contribution to be made by each country towards the total forces required. This breakdown would certainly show deficiencies in some respects, but there would also be surpluses in others. Some of these surpluses may be required to meet other commitments, such as those we have overseas, but there would still remain some elements which are unnecessary. Obviously much of this information could not be made public, on security grounds, but unless an assurance can be given by the Government that our defence requirements are being reviewed on these lines we cannot be satisfied that this greatly increased expenditure on defence will result in our obtaining both a fully efficient defence and the best value for the money that is being spent.

As far as the machinery for controlling defence is concerned some progress towards simplification is being made, and a considerable step forward was made when it was announced on May 3 that the North Atlantic Council would incorporate the Defence Committee and the Defence Finance and Economic Committee, and would become the sole ministerial body in the organisation, responsible for all aspects of defence. The Deputies of the Ministers, whose headquarters is in London and who are in permanent session, now represent not only their respective Foreign Ministers but also their defence and finance Ministers. The actual organisation is shown in the table at the head of the next page.

Nevertheless, it is going to be a formidable task in war to co-ordinate the activities of the twelve (or more should Greece and Turkey become members, as seems possible) signatories to the Treaty. The White Paper on the North Atlantic Treaty Organisation (Cmd. 8214) is included in this issue, from which some idea can be gained of its complexity. In addition to exercising supervision over the forces allotted to the various Supreme Commanders, of whom only General Eisenhower has so far been appointed, each country will at the same time have to ensure that the operations of the forces retained under its own control are co-ordinated



with those allotted to the North Atlantic Treaty Organisation. There has, for instance, already been considerable discussion in the House on how our Navy is to fit into the province of the Supreme Commander of the Atlantic when appointed.

In the same way the appointment announced on May 1, 1951, of the three Commanders-in-Chief designate for Home Defence, who will be responsible in war for the defence of the United Kingdom and who are undertaking the preliminary planning for this role, adds still another complication to the already overburdened machinery both at the national and international levels.

Now that General Eisenhower has been appointed Supreme Commander in Europe under the North Atlantic Treaty, the future of the defence aspects of the Brussels Treaty Organisation is also obscure. Presumably the functions of the Defence Committee, of which Field-Marshal Montgomery was the Chairman, and the forces which it controlled, will now be absorbed into General Eisenhower's Headquarters, but at the time of writing no official announcement on this issue has been made.

Many of these complications stem from the fact that, whilst we all pay lip service to international co-operation and the need for integrating our defence forces, we hesitate to accept the full implications of that policy, as witness the objections raised in many quarters to the proposed European Federation and the formation of a European Army. How much simpler everything would become if we ourselves and the other signatories to the Treaty were prepared unreservedly to pool all our resources under one centralised direction and command organisation. The pressure of events

in the last few years has already resulted in a remarkable change, particularly in the United States and this country, from an insular outlook to an international one, and it may be that in the United Kingdom we shall be prepared before long to abrogate a much greater measure of our national sovereignty than we are as yet ready to contemplate.

W. M. YOOL

CHAPTER II

THE SERVICES IN 1950-51

1950-51 WILL go down in history as a landmark in the annals of the British Armed Forces. Two events of outstanding importance occurred.

The bare framework of the defence organisation of the North Atlantic Treaty Powers, which had been set up in the closing months of 1949, started to take shape during 1950, and, culminating in the appointment of General Eisenhower as Supreme Allied Commander in Europe on December 21, there emerged in outline a tangible structure during the opening months of 1951. On June 25, 1950, war broke out in Korea. Forces of the United Nations, including units of the Royal Navy, the Army, and Commonwealth Forces, went into action against the Communist forces of North Korea, the latter being subsequently joined by large forces from armies of the Communist People's Republic of China.

His Majesty's Government reacted to the serious deterioration in the international situation *vis-à-vis* the forces of the Union of Soviet Socialist Republics and her Communist's satellites by announcing that Great Britain would put into effect a three-year programme of rearmament involving a total expenditure of £3,600,000,000 and would take immediate steps to increase the effective striking power of all three Services. This announcement was made in August 1950. By January 1951 the programme had been revised and expanded to cover a much larger scale of production of ships, aircraft, weapons, and equipment, bringing the total bill up to an estimated sum of £4,700,000,000; to increase the striking power of all three Services; and to allow for a selective call-up of some 235,000 Reservists for refresher training.

Pari passu with these measures the other members of the Atlantic Pact, in particular the United States of America and France, announced large-scale measures of rearmament, designed to give effect to the defence plans drawn up by the North Atlantic Council. The aim and object of these plans was to build up an integrated European defence force under a Supreme Commander, to which Germany was to be "enabled to contribute." But the form this latter contribution was to take was not settled owing to a conflict of views between the Americans, the French, and ourselves, not to mention the Germans. The extent of these measures in a time of peace and when, at any rate so far as Great Britain was concerned, economic recovery was in sight are sufficient comment on the inherent dangers of the international situation which threatened this country and the world in the winter of 1950-51.

NORTH ATLANTIC TREATY AND WESTERN UNION ORGANISATIONS

At the end of March 1950 meetings of the Standing Group, the Military Committee, and the Defence Committee of the North Atlantic Treaty Organisation and of the Western Union Army Chiefs of Staff were held at the Hague. At the final meeting of the Defence Committee on April 1

it was announced that unanimous agreement had been reached on a plan for collective self-defence by the twelve members of the Atlantic Treaty Organisation, namely Belgium, Canada, Denmark, France, Great Britain, Holland, Iceland, Italy, Luxembourg, Norway, Portugal, and the United States. This was an announcement of far-reaching consequence as laying the foundation for unified defence measures to cover the Western hemisphere.

The North Atlantic Council, consisting of the Foreign Ministers of the twelve member-nations, held its fourth session in London from May 15 to 18.

At the conclusion of the session the Chairman, Mr. Acheson (U.S.A.), stated that certain major decisions had been taken. These included:

- (a) The issuing of directives to the Defence Committee and the Defence Financial and Economic Committees to guide them in their future work.
- (b) The recognition of the indispensability of self-help and mutual aid among the member countries, whereby each would make its full contribution to achieve the integrated strength necessary for the North Atlantic area.
- (c) Recognition that effective military defence of the member-nations must be achieved along the lines of the most economical and effective utilisation of the forces and material at the disposal of the North Atlantic countries.
- (d) The establishment of a North Atlantic Planning Board for ocean shipping.

The Council met again in New York on September 26 and agreed upon a five-point plan for setting up an integrated European Defence Force under a Supreme Commander. At this meeting the participation of Germany in Western defence was discussed for the first time, but owing to a sustained objection by the French the Council was unable to go as far as had been hoped in the inclusion of a German military contingent. It was, however, agreed that Germany should be "enabled to contribute" to Western European defence.

The five points agreed upon were:

- (1) That the integrated Force would be organised under the North Atlantic Council.
- (2) That it would be under a Supreme Commander with wide delegated authority for the training of national contingents as an effective force in peace as well as in war.
- (3) That the Supreme Commander would be supported by an international staff representing all contributing nations.
- (4) That pending the appointment of a Supreme Commander there should be a Chief of Staff with responsibility for training and organisation.
- (5) That the Standing Group (i.e. the Chiefs of Staff of France, Great Britain, and U.S.A.) would be responsible for higher strategic direction.

It was further agreed that all available manpower and productive resources should be fully employed in the defence of Western Europe, and

early decisions were sought from governments concerning the allocation of forces.

As events transpired, the fourth point was never implemented, because at a further meeting of the Council held in Brussels on December 21 it was announced that General Eisenhower had been appointed Supreme Allied Commander in Europe. The choice of General Eisenhower for this appointment had scarcely been in doubt and met with wide approval.

This Brussels meeting also approved:

- (a) A proposal to appoint a European Director of Production as a counterpart to the military commander.
- (b) An outline plan for the Western German participation in defence, to be discussed with Western Germany.
- (c) The merging of the military organisation of the Western Union in that of the North Atlantic Treaty.

General Eisenhower arrived at his provisional headquarters in Paris on January 7 and shortly afterwards set out on a tour of all the European capitals in the North Atlantic Treaty Organisation (N.A.T.O.).

On completion of this tour he flew back to the United States for a short period and then returned to establish his permanent headquarters outside Paris. He was followed by Mr. W. R. Herod, President of the International General Electric Company of America, who was appointed Co-ordinator of North Atlantic Defence Production, and who initially set up his office in London.

On February 22, in reply to a question in the House of Commons, the Prime Minister announced that Admiral Fechteler of the United States Navy was to be appointed Supreme Commander, North Atlantic, under the North Atlantic Treaty Organisation. This announcement, which had manifestly been allowed to leak out prematurely, came as a complete bombshell. Surprisingly, Mr. Attlee had not gauged the feelings of members in this matter and the hesitancy and ambiguity of his replies to a spate of supplementary questions appeared to show only too clearly that the Government had failed to appreciate the depth of feeling which this announcement would stir up amongst all classes of the British people.

The Prime Minister made a further statement on February 26. He stated that the Supreme Naval Command would embrace the North Atlantic, but excluding British and European home waters and the Mediterranean. It would be divided into an Eastern and a Western area; the former would be under a British Admiral, namely the Commander-in-Chief, Home Fleet, working in association with the Air Officer Commanding-in-Chief, Coastal Command; whilst the latter would be under an American admiral. All three commanders would have integrated forces at their disposal. In addition, the Commander-in-Chief, Portsmouth, who would be re-designated Commander-in-Chief, Home Station, would be "in sole command of all naval operations in British home waters." The Prime Minister further stated that the Deputy to the Supreme Commander would be British.

Commenting on this statement, *The Times* in a leading article wrote:

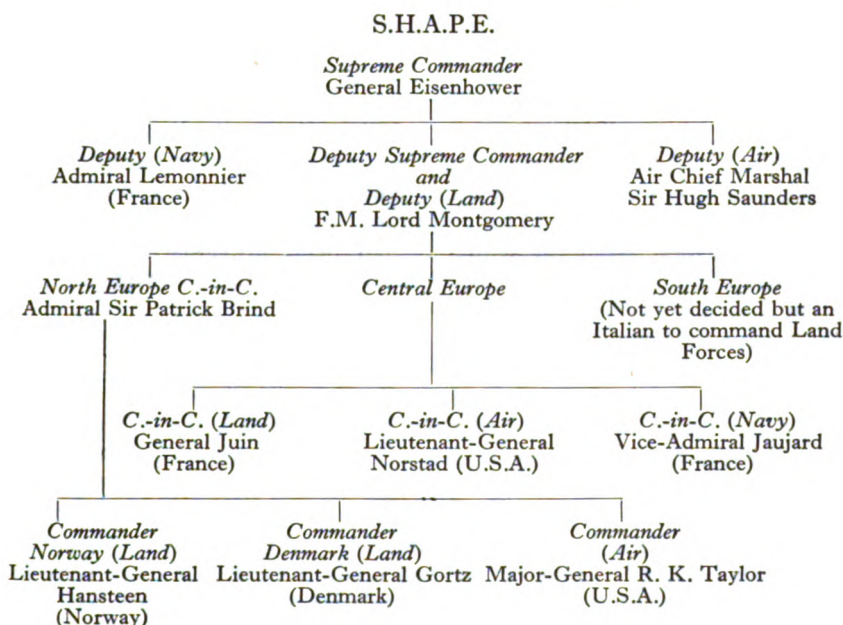
It cannot be said that the Prime Minister's statement on the Atlantic Command has cleared the air. The fog remains though it is perceptibly

thinner. Nothing for many years has aroused so much deep and heated feeling—and real alarm—as the news that supreme naval command in the North Atlantic Treaty Organisation was to go to an American admiral. This was no mere matter of hurt national pride. It was rather the sense that the safety itself of these islands was being put at outside disposal, the fear that the responsibility of British admirals for the British life-line was being put into commission.

At the time of writing the matter is due for further debate in Parliament and comment would, therefore, be premature. It does, however, appear that the title "Supreme Commander" is in this case misleading, since the appointment is to be confined to "overall strategic command" and will not include control of the coastal waters on either side of the Atlantic. The real justification for the appointment of an American admiral would appear to lie in the lamentable weakness to which British naval strength has been allowed to run down since the war as compared with our American friends and allies.

At the time of writing the framework of the command organisation of N.A.T.O. has taken further shape by an announcement issued from Supreme Headquarters Allied Powers in Europe (S.H.A.P.E.) outlining the broad command structure and naming nine of General Eisenhower's principal deputies and commanders.

For convenience these are shown diagrammatically below:



The following appointments to General Eisenhower's staff have also been announced:

Chief of Staff: Lieutenant-General Alfred M. Gruenther (U.S.A.).

Deputy Chiefs of Staffs

Administration: Lieutenant-General Carpentier (France).

Plans: Air Vice-Marshal E. C. Hudleston (British).

Assistant Chiefs of Staff

Personnel and Administration: Rear-Admiral Ferrante Capponi (Italy).

Intelligence: Major-General Sir Terence Airey (British).

Organisation and Training: Major-General F. W. Festing (British).

Plans, Policy, and Operations: Major-General Bodet (France).

Logistics: Major-General Edmond H. Leavey (U.S.A.).

STATEMENT OF DEFENCE 1950-51

The Government's Statement on Defence for 1950-51 was presented to Parliament by the Defence Minister (Mr. Shinwell) on March 6, 1950, and provided for a defence budget of £780,820,000, showing an increase of £20,960,000 over the figure of £759,860,000 for 1949-50.

The allocation of this sum, with comparative figures for 1949-50, was as follows:

	1950-51	1949-50
	£m.	£m.
Admiralty	193·00	189·25
War Office	299·00	304·70
Air Ministry	223·00	207·45
Ministry of Supply	65·00	57·75
Defence Ministry	0·82	0·71
	<hr/> 780·82	<hr/> 759·86

It was pointed out in the White Paper* dealing with the Government's defence policy that this budget catered for a decrease in the numerical strength of the Armed Forces and in the number of civilians employed in defence establishments. On the other hand, there was to be a considerable increase in the money allotted for equipment and research.

The uniformed strength, which it had been previously planned to reduce to 750,000 by April 1, 1950, was now to be brought down to 718,000 by that date, and to 682,100 by April 1, 1951.

The main reductions were to be found from training and maintenance establishments, and by cuts in headquarters staffs. In this way it was aimed to keep the striking power of the Services intact.

This process of reduction had been greatly helped, the White Paper stated, by the comprehensive review of the future development of the forces which the Government had put in hand just over a year previously "in order to establish the roles of the three Services in present circumstances and to ensure that full value was obtained for the money spent on the defence budget." This review had made it clear that there were no grounds for any substantial change in the relative roles of the three Services, or for any drastic curtailment of the strength of any one of them. It was of particular value in establishing priorities and in indicating where reductions could be made with the least serious consequences. A propos of manpower it is of interest to note the following passage in the White Paper:

A review of the Colonial forces by the Chiefs of Staffs Committee has been followed by consultations with the Colonial Governments concerned and, in

* Cmd. 7895.

the case of the East and West African Colonies, by a conference in London. The basic difficulty is that the cost even of the forces required for internal security is often beyond the means of the Colony. Means of bridging the gap are under consideration.

Up to the present, so far as is known, no material results have emerged from these deliberations on this important subject.

The financial saving on uniformed personnel and civilians amounted to about £19,000,000. This saving was to be more than counter-balanced by the increased sums to be spent on equipment and research. These amounted to nearly £35,000,000 more than the corresponding figure for 1949-50. Whilst omitting details of the items falling under this heading, it was stated that air defence and anti-submarine research were receiving much attention.

In summing up the Defence Estimates for 1950-51 the White Paper stated:

The conclusion reached is that the existing balance between the forces is about right. On the Army and Navy together we shall spend about the same in 1950-51 as in 1949-50. On the Air Force and on research and development (much of which is for the Air Force) we shall spend rather more than an extra £20 million. So long as our present responsibilities and commitments remain, our defence budget must be a heavy one, but His Majesty's Government are satisfied that the money to be made available in 1950-51 will be spent to the best possible advantage.

MAN-POWER

The strength of the Forces on January 1, 1950, as officially announced by the Ministry of Defence, was 725,000 men and women made up as follows

			<i>Regulars</i>	<i>National Service</i>	<i>Total</i>
Royal Navy	..	..	129,100	11,400	140,500
Army	..	..	192,700	189,000	381,700
Royal Air Force	..	..	126,300	76,500	202,800

The strength of the Auxiliary and Territorial Forces on January 1, 1950, was 102,100, made up as follows:

					<i>Target</i>
R.N.V.R.	..	..	..	5,100	15,000
R.M.F.V.R.	..	..	..	500	1,500
R.A. and W.R.A.C. (T.A.)	..	..	..	82,500	150,000
R.A.F.V.R.	..	..	..	8,100	38,000
R.Aux.A.F.	..	..	..	5,900	29,000

In the White Paper it was stated:

His Majesty's Government hope that a position will be reached when we can rely far more on regular personnel to discharge our peace-time defence commitments. The primary object of national service (which will still be necessary in default of some major change in the international outlook) would then be the production of trained reserves. At present, however, we are a long way from this goal and national service continues to meet two vital needs. It provides:

- (i) the only means of building up the large reserve of trained man-power that would be needed in a future war; and
- (ii) the men needed in the Services to supplement the numbers which can be raised by recruitment of regulars.

Figures for recruitment for the years 1948 and 1949 showed that the Navy had achieved this goal, but the Army and Air Force had fallen considerably short of it. In particular it was forecast that the Army's strength in men serving on regular engagements would decrease by some 7,000 men during the year.

The only solution was to try to obtain Regular units "on a scale never before attempted in a time of peace and full employment." It was stated that a high level of recruitment could not be expected unless service conditions competed in attractiveness with those of civilian life.

To this end, in spite of existing "practical and financial limits," the estimates included a figure of £9,440,000—an increase of £2,640,000 over the 1949–50 figure—for new major works designed to provide better living accommodation for officers and other ranks, both ashore and at sea: in addition, in 1950–51 a start was to be made on 6,000 to 7,000 new houses for married quarters in the United Kingdom under the Armed Forces (Housing Loans) Act, 1949, and about 2,000 more in overseas stations.

The position regarding the absorption of ex-Regulars in civil life—a most important factor in recruiting—was satisfactory as regards other ranks in 1949, but the position of ex-Regular officers was still unsatisfactory.

The White Paper refuted the suggestion that the Government was confronted with a serious problem in disposing of the numbers available for National Service. Estimates of the numbers of men available for call-up over the next three financial years 1950–53 showed a surplus of about 40,000 in the numbers needed by the Services.

As regards the volunteer element required to build up the strengths of the Auxiliary and Territorial Forces, the position remained unsatisfactory as regards numbers, but the quality of the volunteers coming forward was excellent.

The White Paper concluded with the following summary of policy for manning the Services:

First, to encourage by all practicable means Regular recruiting and re-engagements; second, to rely, as they must, on the continuance of National Service to make up the numbers required to meet current commitments, and to provide trained Reserves; and third, by ensuring that both Regulars and National Servicemen are employed to the best advantage, to keep the total numbers in the Services as low as possible, consistent with meeting our commitments. No other policy is possible at the present time.

During the debates in Parliament on the Defence Budgets many members of both Houses expressed serious concern at the declining strength and lack of striking power in all three Services.

As subsequent events showed, their concern was well-founded. The situation in Malaya showed no signs of improvement, and on June 25 war broke out in Korea.

EMERGENCY DEFENCE MEASURES

On July 26 and 27 an important debate on defence took place in the House of Commons. Opening the debate, the Minister of Defence revealed some alarming figures of the estimated strength of the Soviet Armed Forces. He stated that the U.S.S.R. disposed of some 175 active divisions, of which one-third were armoured or mechanised; an appreci-

able number of these were stationed in the Soviet Zone of Germany and kept at an immediate state of readiness. The number of men under arms was 2,800,000, and this number could be doubled on mobilisation.

The number of military aircraft was estimated to be 19,000 including modern jet fighters and bombers. In addition, there were considerable naval forces including large numbers of up-to-date submarines. Mr. Shinwell then announced that the Government proposed to ask the House to vote an additional sum of £100,000,000 for immediate defence requirements.

Furthermore it was proposed to retain in the Fleet personnel due for discharge in order to maintain the Far East Fleet at war strength. If necessary, similar action would be taken for the Army and Air Force.

Both these measures were passed by the House without a division. The Minister of Defence also announced that there would be no increase in the period of compulsory National Service.

On the second day of the debate, the Opposition's motion for a secret debate having been defeated by one vote, Mr. Churchill rose to deliver a remarkable speech, reminiscent of his warning speeches of the 1937-38 period. Quoting figures given by official spokesmen in the United States and France, he referred to the estimated strength of Soviet tanks at 40,000 and compared it with our own figures of 6,000 as given by Mr. Shinwell. He warned the House that the threat to Western Europe was a very grave one which at any time could be translated into action by some eighty Soviet divisions. Against these the Western powers disposed of eight weak divisions (two British, two American, three French, and one Belgian) in Western Germany backed by a further four divisions (three French, one Belgian) outside Germany.

Although there was little in Mr. Churchill's speech which had not already been revealed or surmised, the general public had never before been given the whole terrible picture on one canvas. The speech came as a shock to the country, which quickly realised that the measures proposed by the Government were woefully inadequate.

There can be little doubt that Mr. Churchill's warning aided by strong American prompting was an important factor in the Government's subsequent decision to take action on a very different scale to that contemplated in Mr. Shinwell's speech.

On July 30 the Prime Minister (Mr. Attlee) broadcast to the nation. After a survey of events leading up to the war in Korea, he appealed for more Regular recruits for the Services and for men and women volunteers to join the Territorial and Auxiliary Forces. He further appealed for volunteers to train for the Civil Defence Services and concluded by a warning to all to be on their guard against the enemy within. This warning had reference to the recent sabotage of ammunition lighters in Portsmouth Dockyard and other cases of suspected sabotage in H.M. ships.

On August 3 the Government announced a three-year British Defence Plan, involving a total expenditure of £3,400,000,000 to be spread over the period 1950-53. The announcement was contained in the text of a memorandum handed to the United States Ambassador, Mr. Lewis Douglas, on the previous day for transmission to Washington. The memorandum, which was in reply to a United States inquiry of July 26, pointed out that it would be impossible to carry out the full programme

without substantial assistance from the United States, in addition to the completion of the European Recovery Programme (E.R.P.).

On August 30 two Command Papers* were laid before Parliament. The first outlined details of increases of pay for all ranks of the Regular Forces, men and women, up to the equivalent rank of brigadier (similar increases for officers above this rank were announced in a White Paper published on September 14†). The second White Paper dealt with the proposed extension of the period of whole-time National Service from eighteen months to two years for all men who had not completed their period of full-time service before October 1, 1950. This measure would mean an increase of 77,000 men with the Colours.

During a three-day debate in the House of Commons from September 12 to 14 the Prime Minister, opening the debate, moved a resolution expressing approval of the Government's measures as outlined in the two White Papers, and asking for the necessary legislation to amend the National Service Acts to be brought in forthwith.

In the course of his speech Mr. Attlee announced that the proposed increases in pay and in the strengths of the Services would bring total defence expenditure under the three-year plan up to £3,600,000,000 as against the £3,400,000,000 previously announced. In addition the Government were proceeding with measures which would involve expenditure of another £100,000,000 in the immediate future. The Prime Minister also gave some idea of the effect of these measures in increasing our armed strength. He said that the full effect of the manpower proposals would not be felt until 1951, but subject to this limitation the increase would be on the following lines.

For the Royal Navy the main effect would be a substantial programme of new construction, modernisation, and conversion. Anti-submarine frigates, mine-sweepers, and motor torpedo-boats would have priority.

With regard to the Army, we had the equivalent of six and a half divisions overseas, and it was proposed to increase the strategic reserve at home to include a complete Infantry division, an Armoured division, and an Infantry brigade. There would be an additional division stationed in Germany, and the two divisions there would be brought up to strength; it would be possible also to bring up to full strength the four existing divisions in other parts of the world. In addition there would be the twelve Territorial divisions.

Plans for the R.A.F. included orders for a substantial increase in jet fighters and greater production of the Canberra bomber, which could be very important in any campaign in Western Europe. Certain additional squadrons were being formed in the British Air Force of Occupation as our share of the Western Union Tactical Air Force, and further orders for aircraft of a wide and complicated range and for vital ancillary equipment were being worked out.

The National Service Bill, extending the period of service to two years, passed through all stages in the House of Commons without a division on September 15; in the House of Lords the bill was passed through all its stages on September 18, receiving the Royal Assent on the same day.

At a meeting of the North Atlantic Council in Brussels on December 19 the Foreign Secretary (Mr. Bevin) stated that, in view of the urgent need

* Cmd. 8027 and Cmd. 8026.

† Cmd. 8047.

to strengthen the defences of the free world, the British Government had decided to increase and accelerate their defence preparations still further. The effect of this decision was given by the Prime Minister in an important statement to the House of Commons on January 29.* Mr. Attlee stated:

As a result of earlier measures the numbers in the Active Forces have already been substantially increased. The total strength of the Armed Forces will, by April 1 next, reach 800,000 men—as compared with the figure of 682,000 given in the last White Paper on Defence. We are, however, without the trained reserves of officers and men with up-to-date training who would be required to fill our existing formations in an emergency. . . . The Government now propose to fill this gap by calling on a number of selected Reservists who have the up-to-date training required, and giving them a period of refresher training so that, if an emergency arose requiring general mobilisation, they would be ready to take their place in units with which they would have to serve.

We have, therefore, decided to call up this summer for fifteen days' training with the Army up to 235,000 Reservists, officers and men. The great majority of the men will be Class "Z" Reservists who were called up before the end of 1948.

He then went on to detail the allocation of these reservists as follows:

ARMY

Class "Z" Reservists

For training with Territorial units and formations, 80,000.

For Anti-Aircraft Command, 40,000.

For Regular formations at home, and for various technical, administrative, and fighting units required in war overseas and at home, 115,000.

ROYAL AIR FORCE

Class "G" Reservists

For the Control and Reporting Organisation, 10,000.

Men in "reserved occupations" were not to be called up. The list of these "reserved occupations" however, remained obscure.

There was to be a further selective call-up of the Regular Reserve and Auxiliary Forces as under:

ROYAL NAVY

Royal Fleet Reserve for eighteen months' service, about 6,000.

Emergency List of the R.N., the R.N.V.R., or the R.N.V.S.R. for eighteen months, about 600 officers, of whom a good proportion it was hoped would be volunteers.

ROYAL AIR FORCE

All Royal Auxiliary Air Force squadrons complete for three months, about 2,300.

Regular and Volunteer Reserves for three months, about 1,000 aircrew Reservists; and in addition about 200 more might be called up for eighteen months for flying instruction duties.

* Cmd. 8146.

As regards men already serving on Regular engagements, it was proposed to retain them with the Colours for a period after the expiry of their Colour service. This period was not to exceed eighteen months for the Royal Navy; twelve to eighteen months for the Army; and twelve months for the Royal Air Force.

Summing up the object of these measures, the Prime Minister stated:

The general purpose of all these plans is to make more effective the Regular Forces now in being, and to ensure that mobilisation, if it became necessary, could be carried out more rapidly and smoothly than would otherwise be possible. This applies particularly to the provision of units and formations which would be required in the initial stages of an emergency. For the Navy, the measures proposed will enable more ships to be put into full commission, and will enhance the state of readiness of the Reserve Fleet. They will enable the Active Army to move more rapidly to a war footing in an emergency, and they will facilitate the rapid mobilisation of certain formations and units of the Territorial Army. For the Air Force, they will enable additional squadrons to be formed more quickly, will greatly improve the overall efficiency and readiness of our air defences, and will provide for the additional training requirements both of the front line units and of the reserves.

As regards production, the statement contained little information except in the broadest terms. Mr. Attlee said, "If the programme is fully achieved, the total defence budget over the next three years, covering all the military and civil preparations but excluding stockpiling, may be as much as £4,700,000,000. Nearly half of this will be for production." Availability of machine tools and raw materials were the bottle-necks.

Assuming these difficulties could be overcome, the programme aimed at quadrupling the armed output of tanks and combat aircraft by 1953-54. Other items mentioned were new types of fighter aircraft, increased production of the Canberra medium bomber, and the placing of the first order for a four-engined jet bomber.

The programme of building and converting ships to deal with the submarine and mining threats was to be accelerated, as also was the production of new combat vehicles and anti-aircraft and anti-tank equipment.

In the subsequent debate in the House of Commons on February 15 and 16 the Minister of Defence announced that the Government proposed to station one additional division in Germany, making a total of four. This division would be found from home, thus reducing the strategic reserve of Regular divisions in this country to one plus one independent brigade. The naval construction programme of frigates, minesweepers, and small craft was to be increased, and the air arm re-equipped with new types of aircraft. New squadrons of the Royal Air Force had already been formed in Germany and the Middle East, and the day-fighter strength of Fighter Command had been doubled.

The programme envisaged a further major expansion of Fighter Command and increases of Bomber and Coastal Commands. The run down of Transport Command had been stopped.

The programme was approved by both Houses after a motion of no confidence in the Government's ability to carry out an effective and consistent defence policy had been defeated in the Commons by twenty-one votes.

The Defence Estimates for 1950-51 published on February 16, 1951, provided for a total expenditure of just over £1,000,000,000. Since they had been prepared before the three-year defence programme had

been revised to cover the expenditure of up to £4,700,000,000, they were already out-of-date on publication. Moreover, it had already been announced by the Government that the total defence bill for the year would amount to some £1,300,000,000. This implied that further supplementary estimates would have to be introduced before the end of the financial year to cover the balance of about £300,000,000.

MINISTRY OF DEFENCE

The following vacancies were allotted for the 1950 course at the Imperial Defence College: Royal Navy and Royal Marines, 8; Army, 10; Royal Air Force, 8; Canada, 4; Australia, 4; India, 2; New Zealand and Pakistan, 1 each; Civil Services, 12.

GENERAL SERVICE MEDAL—MALAYA

It was announced on March 21, 1950, that H.M. The King had approved recommendations for the award of two current General Service medals—one for the Royal Navy and the other for the Army and the Royal Air Force—each with an appropriate clasp, for service in Malaya since June 16, 1948. The Army and R.A.F. Medal will also be awarded to qualified members of specified Police Forces.

SCIENTIFIC ADVISERS TO THE MINISTER OF DEFENCE

As from July 1, 1950, Sir Henry Tizard, who had been scientific adviser to the Ministry of Defence since 1947, relinquished his full-time appointment, and handed over to Sir Frederick Brundrett, previously chief of the Royal Naval Scientific Service, who became Deputy Scientific Adviser, Ministry of Defence. Sir Henry Tizard retained his chairmanship of the Defence Research Policy Committee.

A meeting of the Commonwealth Advisory Committee on Defence Science was held in Great Britain from July 3 to 20. It was attended by senior defence scientists of the Commonwealth countries and by serving senior officers concerned with the scientific aspects of war.

CHIEF OF COMBINED OPERATIONS

On October 2, 1950, Major-General V. D. Thomas, C.B., C.B.E., Royal Marines, relieved Major-General G. E. Wildman-Lushington, C.B., C.B.E., Royal Marines, as Chief of Combined Operations Staff.

COMBINED TRAINING

Field-Marshal Sir William Slim, Chief of the Imperial General Staff, held the fifth of the post-war annual conferences and tactical exercises for the Army at the Staff College, Camberley, in May 1950. The exercise, named "Horatius", was designed to study defence in warfare. General officers of the Army from both home and overseas Commands, together with senior officers of the Royal Navy and Royal Air Force, attended. It concluded with a demonstration of concealment by all arms, including Armour, Artillery, and Infantry units.

During July a demonstration of modern assault landing methods and equipment was held in the Portsmouth and Isle of Wight areas. It took the form of a combined exercise, known as "Run Aground," in which the Royal Navy, Royal Marines, and detachments of many arms of the Army took part.

The first part comprised a demonstration of assault-landing and cliff-scaling by Royal Marine Commandos at Culver Cliff, Isle of Wight. The second part was a demonstration of assault-landing on a defended beach with tanks and vehicles, using modern landing craft and equipment.

On July 19 a Civil Defence exercise, known as "Jolly Jack," took place at Chatham. It was attended by the C.-in-C. The Nore, Admiral Sir Henry Moore, the Director-General of Training (Civil Defence) The Home Office, and representatives of all three Services.

The object was to discuss problems of mutual interest to the fighting Services and the Civil Defence authorities.

In December another Civil Defence exercise was held at Headquarters, Eastern Command, Hounslow, and was attended by the Home Secretary (Mr. Chuter Ede), The Secretary of State for War (Mr. Strachey), and representatives of the Air Ministry, the London County Council, and London Boroughs. The object of this exercise was to determine the manner in which military assistance could best be given in the event of an air attack on London.

The British Army of the Rhine and the British Air Forces of Occupation held their joint manœuvres in Germany from September 24 to 30 under the direction of their respective Cs.-in-C., Lieutenant-General Sir Charles Keightley and Air Marshal Sir Thomas Williams.

Also taking part in these manœuvres were Royal Naval air squadrons, a detachment of Royal Marines, as well as American, Belgian, and Danish troops.

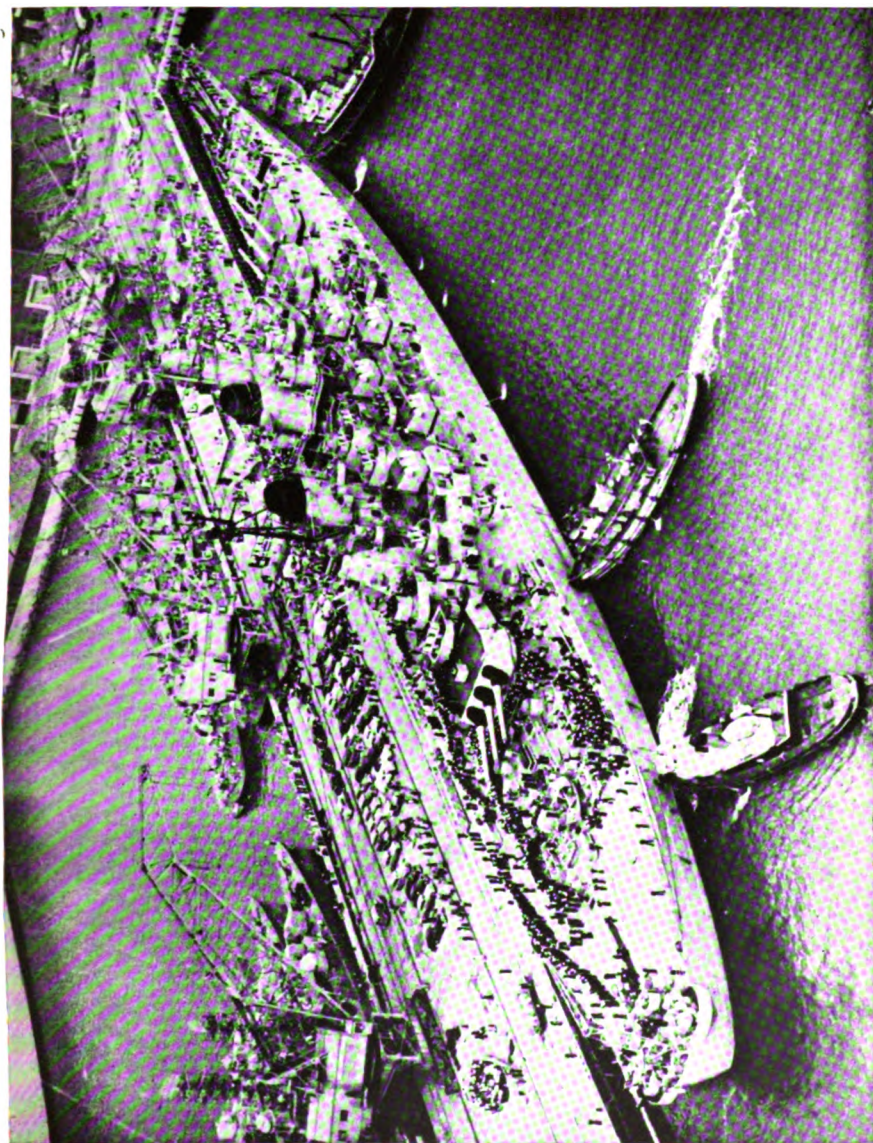
The manœuvres comprised two exercises. The first was designed to give the Army practice in movement and concentration in the face of enemy air superiority, and the Air Force practice in locating and attacking troop movements in rear of the battle area. The second exercise was designed to give the Army practice in operating on wide fronts, entailing movement laterally and from front to rear, as well as quick concentration for attack and dispersion afterwards, and to give the Air Force practice in close support.

COURTS MARTIAL APPEAL COURT

The Minister of Defence (Mr. Shinwell) announced in the House of Commons that the Government had decided to introduce legislation to give effect to the recommendations of the Lewis Committee on Army and Air Force Courts-Martial and the Pilcher Committee on Naval Courts-Martial in respect of the setting up of a Courts-Martial Appeal Court.

FORMATION OF A HOME GUARD IN EVENT OF EMERGENCY

On November 15 the Minister of Defence announced that the Government had decided that a Home Guard should be raised on a part-time basis in a future emergency; that it would not be enrolled before the actual emergency arose; but that planning measures would be put in hand at



U.S.S. Missouri (The Mighty "Mo") docking at Long Beach Naval Base, Los Angeles, on her return from Korea



Gun team in action with the British Army's largest gun—the 240 mm.

once. It would be raised and operated on similar lines to the Home Guard of the last war and would be administered by the War Office through the Territorial and Auxiliary Forces Associations as part of the Armed Forces.

THE WAR IN MALAYA

The situation in Malaya, which had shown signs of improvement in the closing months of 1949, suffered a sharp set-back in the opening months of 1950. The toll of death and destruction by the Communist guerrilla bands steadily mounted despite the employment of some 17,000 British troops (including a Royal Marine Commando Brigade), 10,500 Gurkhas, and four battalions of the Malay Regiment together with about 70,000 regular and auxiliary police, the whole being supported by a considerable number of R.A.F. squadrons of fighter, bomber, and transport aircraft.

From the outset of the campaign in June 1948 it had been clear that the problem of combating the Communists was not primarily a military one, but called for concerted action by the civil administration, the fighting Services, and the police under the overall direction of the High Commissioner. There were three main reasons to account for the failure of this considerable force of Services and police to overcome the resistance of the guerrillas, whose numbers were variously estimated not to exceed from 3,000 to 10,000 at any one time.

First, as the armed forces and police swept an area of jungle, clearing the guerrillas bands before them, they left behind a partial vacuum. Into this unprotected area the enemy sooner or later filtered back in small parties.

Secondly, the vacuum was never complete, because the civil administration had not the means of evacuating or controlling the large numbers of squatters settled on the verge of the jungle, who, voluntarily or through intimidation, nourished the guerrillas with supplies, cash, and (more important than all) information.

Thirdly, despite reverses and heavy casualties, the guerrillas were encouraged by outside events, namely, the successes of Mao-Tse-tung in China and his Viet-Minh allies in Indo-China.

By the early spring of 1950 it became apparent that the measures already taken were inadequate. Consequently in April Lieutenant-General Sir Harold Briggs, late Indian Army, was appointed Director of Operations in a civil capacity under the High Commissioner, with power to co-ordinate and control the armed forces and police, and to introduce under the emergency regulations such further measures as might be necessary in the sphere of civil administration.

General Briggs wasted no time in formulating new measures. Under the Briggs' plan the problem of the squatters was at last seriously tackled. Steps were taken to strengthen the police and civil administrative services, and to build settlements so that the squatters could be concentrated in suitable localities under proper supervision. All these are long-term measures and rapid results were not to be expected. Nor, indeed, have they yet materialised. The serious set-back to the United Nations in Korea at the end of November was followed by a new crop of assassinations in Malaya. General Briggs flew to London to confer with Ministers in Whitehall. As a result of this visit further measures were introduced to

place Malaya on a semi-war footing. These entailed more vigorous measures for strengthening the police and administrative services; the speeding up of delivery of materials and equipment required for the campaign; and the power to enforce limited measures of conscription.

The seriousness of the situation in Malaya cannot be under-estimated. Time alone will tell whether the new measures will prove effective.

THE WAR IN KOREA

On June 25, 1950, forces from the Communist territory of North Korea invaded South Korea. The Security Council of the United Nations Organisation immediately called for a cessation of hostilities and the withdrawal of North Korean forces behind the 38th Parallel—the interstate boundary. On June 26, North Korea having ignored the Security Council's request, President Truman ordered the United States Forces to support South Korea.

On June 28 Mr. Attlee announced that, in response to a resolution of the Security Council recommending that members of U.N.O. should furnish assistance to the Republic of South Korea, the British Far East Fleet had been ordered to co-operate with the U.S.A. Fleet in Korean waters.

A few days later British and United States destroyers engaged six North Korean motor torpedo boats and sunk five of them. Thuswise Great Britain entered the Korean War—the first war in which United Nations Forces were ranged against an aggressor.

Since that date ships and aircraft of the Royal Navy have been continuously engaged in patrolling Korean waters and supporting the land forces.

On August 20 the Prime Minister announced that the Government had decided to send a land force to Korea from troops stationed in Hong Kong. Replacements for Hong Kong were to be found from home.

On August 25 the 1st Battalion The Middlesex Regiment and the 1st Battalion The Argyll and Sutherland Highlanders comprising the 27th Infantry Brigade disembarked at Pusan from Hong Kong.

The brigade was later joined by the 3rd Battalion Royal Australian Regiment and the 2nd Battalion Princess Patricia's Canadian Light Infantry.

The 27th Brigade, after a brief period for training and equipment, went into action and has been engaged almost continuously up to the time of writing. It played a notable part in the capture of Seoul in the last week of September and the subsequent advance and withdrawal to south of the 38th Parallel after the Chinese intervention in late November. Its conduct and high standard of training have evoked admiration from the American commanders under whom it has served.

In September a Royal Marine Commando unit arrived in Korea by air from the United Kingdom. A detachment took part in the landing at Inchon on September 18. The complete unit subsequently fought alongside the 1st U.S. Marine Division in the Changjin Reservoir area, where they were cut off by Chinese troops and fought most gallantly in the breakthrough to the port of Hungnam, whence the force was safely evacuated by sea.

During October and November the British 29th Independent Infantry

Brigade, comprising the 8th Hussars, the 1st Battalions of the Royal Northumberland Fusiliers, The Gloucester Regiment, and The Royal Ulster Rifles, together with supporting arms, reached Korea from the United Kingdom by sea. Early in December the brigade was reported in action covering the withdrawal south through Pyongyang, and up to the time of writing has been continuously in action for four months. With the intervention of China (with her massive reserves of manpower) in Korea the whole picture changed and one can only foresee a lengthy and wearisome campaign ahead, so long as the United Nations Forces are precluded from attacking Chinese communications, installations, and troop concentrations north of the River Yalu.

THE ROYAL NAVY

In considering the Naval strength of this country to-day it is advisable to keep in mind the broad structure of Imperial defence over the past thirty years, and to note the changes which have taken place in the relative distribution of national resources to the three Services.

To evolve a perfect yardstick would entail a multitude of statistics. The albeit imperfect yardstick of money will, however, suffice to indicate the major changes which have taken place. The following figures of Estimates are therefore significant:

				<i>Navy</i>	<i>Army</i>	<i>Air Force</i>
				£m.	£m.	£m.
1913	..	..	..	46	28	—
1939	..	..	..	93	85	14
1951	..	..	..	278	419	329

These figures show that from being the strongest arm of defence up to the outbreak of World War II, the Navy has now sunk to third place. Bearing in mind that we are now allied to the immense Naval power of the United States, that the Royal Air Force has become a partner to the Royal Navy in anti-submarine warfare, and that the Navies of the Dominions have increased in strength in recent years, the facts remain that the potential enemy disposes of a greater submarine strength than Germany possessed either in 1914 or 1939, that the range and speed of submarines have increased greatly in the last five or six years, that the danger now threatens in both Western and Eastern waters, and that, as ever, the security of these islands in war depends upon sea communications. These are sobering thoughts, and no intelligent Englishman can but deplore the extent to which our Naval strength has been allowed to decline since 1945.

THE NAVAL ESTIMATES

In presenting the Navy Estimates on March 9, 1950, the First Lord, Viscount Hall, said that the proposed provision for the year 1950-51 was £193,000,000, which was an increase of £3,750,000 over the sum voted for 1949-50. Increased provision had had to be made for the Reserves and for non-effective Services; at the same time account had had to be taken of higher prices and certain increases of pay, together with the exhaustion of war-time stocks and special measures in the Far East.

Vote A provided for a maximum bearing of 143,000 for the Royal Navy, Royal Marines, and ancillary Services, including the Women's Royal Naval Service (6,000) and Queen Alexandra's Royal Naval Nursing Service (240). During the year the uniformed strength of the Navy was to be progressively reduced from 140,000 to 127,500, the greater part of the reduction being brought about by a smaller intake of National Servicemen, whose numbers would be brought down to 3,000 by the end of the financial year.

As a result of these measures it had been possible to increase the net provision for production and research by about £10,000,000. "I propose during the forthcoming year," stated the First Lord, "to undertake a small programme of new construction limited to minor types of warships. Provision in the Estimates under this head is £12,907,000. . . . One of the major tasks confronting the Admiralty is the protection of shipping in any future war against attack by high speed submarines. During the past year technical as well as tactical advances have been achieved in our anti-submarine measures, and exercises for the protection of convoys against submarine attack have been prominent in the training of the main Fleets."

The table of the strength of the Fleet, included in the First Lord's published Statement,* showed that the Active Fleet consisted of the fleet carrier Implacable, the light fleet carriers Vengeance, Theseus, Glory, and Triumph, 14 cruisers, 34 destroyers, 27 frigates, 32 submarines, and 10 minesweepers. Training and experimental ships were headed by the Vanguard; all other battleships being in Reserve.

The construction programme included 2 fleet carriers, 7 light fleet carriers, 3 cruisers, and 8 destroyers; but in fact work on the cruisers was suspended and the other new construction was proceeding very slowly.

Introducing the Estimates in the House of Commons on March 22 the Parliamentary Secretary, Mr. Callaghan, said that the economy of 10,000 in manpower had not been achieved at the expense of the sea-going Fleet.

Further new economies included the abolition of H.M.S. Cochrane, ship of the Flag Officer Commanding Scotland and Northern Ireland, the closing down of the headquarters of the Royal Marines at Chatham and the dockyard at Bermuda. The 8-inch cruisers London, Norfolk, and Sussex are also to be scrapped.

After referring to submarines with a new fast battery drive, Mr. Callaghan said that another type was capable of sustained high speeds under water; according to the best information available to the Government no nation was as yet beyond the experimental stage with these or had progressed further than we had in research. The Admiralty intended that in due course all antisubmarine vessels should be able to hunt the new battery-drive type of submarine.

As regards developments in armament the Parliamentary Secretary stated that new types of homing torpedoes were in the experimental stage; that a new single-packet anti-submarine aircraft, the G.R. 17, was being developed for carrier-operation; and that it was proposed to introduce a new single jet-engined attacker aircraft with a maximum speed approaching 600 m.p.h.

Dealing with personnel, he referred to the growing shortage of aircrews,

* Cmd. 7897.

one reason for which was the small number of long-service ratings who were offering to re-engage, and disclosed that up to 29 per cent. of the commissions in the Royal Navy were now awarded to the lower deck.

EMERGENCY MEASURES

Following the outbreak of war in Korea the Admiralty introduced some measures to increase the manpower of the Navy and to speed up new construction.

With a view to increasing the crews of the Far Eastern Fleet from peacetime strength to that required by continual readiness for action and for other emergency commitments, steps were taken to retain in service officers, Regular ratings, and other ranks due for release, and to recall a limited number of officers, ratings, and other ranks of the Emergency List and the Royal Fleet Reserve and pensioners.

The number affected by these measures was initially about 1,000 men and between 50 and 100 officers, the latter being mainly aviation pilots.

The strength of the Far Eastern Fleet at this time was 1 light fleet carrier, 3 cruisers, and 16 destroyers and frigates.

Out of the extra £100,000,000 which the Government proposed to spend immediately on defence, the Navy's share was to be mainly devoted to speeding up the existing programme of new construction and the modernisation of ships, particularly anti-submarine forces.

The programme of refitting affected 89 ships of the Reserve Fleet, including 7 destroyers, 9 frigates, and 16 fleet minesweepers.

The progress of Naval construction and conversion was reviewed by the Parliamentary Secretary to the Admiralty in the House of Commons on October 25. His speech revealed that the programme of construction under the 1950-51 Estimates had been increased by the addition of 2 anti-submarine frigates, 41 minesweepers, and some small craft. The conversion of fleet destroyers into anti-submarine frigates was already under way, and 6 of them would be in dockyard hands by the end of the year. More were planned to follow in 1951. A programme of converting war-time submarines to higher speeds had also begun.

Of the Reserve Fleet the aircraft carrier *Victorious* was being modernised to handle future types of aircraft; by March 1951 the number of refits carried out during the previous three years would amount to 450, including 88 which were part of the emergency defence programme.

A start was also being made on the building of stocks of degaussing and other equipment for the protection of the Merchant Fleet in war.

The Navy Estimates for 1951-52 published on February 17 showed that the strength of the Fleet had declined during the year by 2 destroyers, 3 frigates, and 10 submarines. The only new ship accepted into the Navy was the survey ship *H.M.S. Cook*. As regards new construction, it was stated that it was proposed to lay down as many anti-submarine frigates as possible during 1951-52. These were to be of two types, one of them simpler and cheaper than the other. There was also to be a third class of frigate "for other special" duties, and work on two prototypes had already begun in Royal dockyards.

The conversion of older destroyers into anti-submarine frigates was being "pressed forward with all speed," and these ships, it was stated,

should be capable of dealing with any submarines which a potential enemy was likely to be able to put into service for many years. Of these, too, there was to be a simpler and cheaper class, of which the first ship to be converted, H.M.S. Tenacious, was already in hand.

Commenting on the Estimates as a whole "The Times" Naval Correspondent remarked, "The Statement and the Estimates provide evidence of energetic development by the Admiralty and the Navy as a whole. But the contrast between the immensity of the sums now needed for the maintenance and replacement of the Fleet and its equipment, and the slow progress in achieving any noticeable restoration of the Fleet to adequate operational strength, is still very marked."

BOARD OF ADMIRALTY

In March 1950 the Commissioners for Executing the Office of Lord High Admiral of the United Kingdom were:

The Right Hon. Viscount Hall.

Admiral of the Fleet Lord Fraser of North Cape, G.C.B., K.B.E.

Admiral Sir Cecil H. J. Harcourt, K.C.B., C.B.E.

Vice-Admiral M. M. Denny, C.B., C.B.E., D.S.O.

Vice-Admiral H. A. Packer, C.B., C.B.E.

Vice-Admiral J. Mansergh, C.B., C.B.E.

Vice-Admiral Sir George E. Creasey, K.C.B., C.B.E., D.S.O.,
M.V.O.

Rear-Admiral R. A. B. Edwards, C.B.E.

The Right Hon. J. Dugdale, M.P.

W. J. Edwards, Esq.

Sir John G. Lang, K.C.B.

In September Vice-Admiral A. C. G. Madden, C.B., C.B.E., succeeded Admiral Sir Cecil Harcourt as Second Sea Lord; Vice-Admiral The Right Hon. Lord Louis Mountbatten, K.G., G.C.S.I., G.C.I.E., G.C.V.O., K.C.B., D.S.O., succeeded Vice-Admiral Packer as Fourth Sea Lord; and Lieutenant L. J. Callaghan, M.P., R.N.V.R., succeeded The Right Hon. J. Dugdale as Parliamentary Secretary.

In December Rear-Admiral E. M. Evans-Lombe, C.B., succeeded Rear-Admiral Edwards as Assistant Chief of the Naval Staff.

FLAG APPOINTMENTS

The following more important flag appointments took place during the year on the dates given:

Mediterranean: Admiral Sir John Edleston, K.C.B., C.B.E., to be Commander-in-Chief (May).

South Atlantic: Vice-Admiral H. A. Packer, C.B.E., C.B., to be Commander-in-Chief (August).

Washington: Admiral The Hon. C. E. Douglas-Pennant, K.C.B., C.B.E., D.S.O., to be Admiral, British Joint Services Mission (August).

Portsmouth: Admiral Sir Arthur J. Power, G.C.B., G.B.E., C.V.O., to be Commander-in-Chief (September).

- The Nore*: Admiral Sir Cecil H. J. Harcourt, K.C.B., C.B.E., to be Commander-in-Chief (November).
Far East: Vice-Admiral The Hon. Guy H. E. Russell, C.B., C.B.E., D.S.O., to be Commander-in-Chief (February).
Flag Officer (Air): Vice-Admiral C. E. Lambe, C.B., C.V.O., to be Flag Officer (Air) (Home) (March).
Germany: Rear-Admiral G. W. G. Simpson, C.B., C.B.E., to be Flag Officer and Chief British Naval Representative on the Allied Control Commission (November).
Second Cruiser Squadron: Rear-Admiral C. A. L. Mansergh, C.B., D.S.O., to be Flag Officer Commanding (August).
Reserve Fleet: Vice-Admiral H. W. U. McCall, C.B., D.S.O., to be Flag Officer (November).
Admiral Commanding Reserves: Rear-Admiral W. R. Slayter, C.B., D.S.O., D.S.C. (October).
Washington: Rear-Admiral J. F. Stevens, C.B.E., to be Chief of Staff to the Head of the British Joint Services Mission (November).
Western Europe: Rear-Admiral P. G. L. Cazalet, D.S.O., D.S.C., to be Chief of Staff to the Flag Officer, Western Europe (November).
Director of Naval Intelligence: Rear-Admiral Sir Anthony W. Buzzard, Bt., D.S.O., O.B.E. (January).
Third Aircraft Carrier Squadron: Rear-Admiral Caspar John to be Flag Officer Commanding (January).

PERSONNEL

The names of thirty-nine officers selected for permanent Commissions in the Royal Navy from among war-time members of the R.N.R. and R.N.V.R. of the Executive Branch who have been on extended service were published in an Admiralty message to the Fleet on March 31.

From a large number of applicants over 600 officers were selected and given extended commissions in 1946 and 1947, and it was notified that later up to fifty transfers to permanent commissions would be made. Eleven such transfers were made in 1949. The further thirty-nine now granted completes the total of fifty. They all hold the rank of lieutenant.

On June 9 the Admiralty announced that applications were invited from university graduates and qualified teachers under 36 years of age for commissions in the Instructor Branch, Royal Navy. Officers with qualifications in mathematics, science (physics, chemistry, or metallurgy), or engineering were required. Commissions would be for three, four, or five years, and after two years' service opportunities would be afforded for them to transfer to the Permanent List.

In December the age limit for Dartmouth cadetships was changed from 16 years—16 years, 4 months to 16 years—16 years, 8 months. The effect of this change will be to enable boys to sit for the examination twice, if they so wish, whereas previously they could only sit once.

At the beginning of 1951 as a means of overcoming the serious shortage of flying personnel the Admiralty invited former naval pilots and those serving in the R.N.V.R. who had completed 300 flying hours in Service aircraft to take up short-service commissions. These commissions would normally be for four years, but some might be extended to six years. The

maximum age for applicants was 33 years, and on terminating their commissions they would be entitled to gratuities, for example, £700 after four years.

New and increased rates of pay for officers, ratings, and other ranks of the Royal Navy and the Royal Marines and of flying pay came into force on September 1, 1950.

WOMEN'S ROYAL NAVAL SERVICE

In view of the satisfactory reports received on the work and capacity of W.R.N.S. aircraft mechanics it was decided to give them the same training and, so far as physical limitations permit, to allot them the same duties in Naval Air Stations as men in the Mechanic (A) and (E) categories of the Naval Airman Branch. They were renamed Wren Air Mechanic (Airframes) or Wren Air Mechanic (Engines). Their duties will not normally entail flying.

The W.R.N.S. having been established as a permanent force, the advancement regulations for ratings in all categories will be brought into line, so far as possible, with those for R.N. ratings.

In May H.R.H. the Duchess of Kent, Commandant of the Women's Royal Naval Service, made her first visit to the W.R.N.S. quarters at St. Budeaux, where Wrens employed at Naval establishments in the Plymouth area are accommodated. She also visited the R.N. Air Station, Culdrose, Cornwall, where she saw Wren telegraphists and meteorologists at work in the airfield control tower and air mechanics and radio mechanics employed on Firefly aircraft.

In November Superintendent Mary K. Lloyd, O.B.E., succeeded Dame Jocelyn M. Woollcombe, D.B.E., A.D.C., as Director.

ROYAL NAVAL VOLUNTEER RESERVE

An extensive programme of exercises and visits to foreign parts for R.N.V.R. divisions and air squadrons took place during the summer. Four divisions—Tyne, Mersey, Solent, and Humber—visited Continental ports.

The motor minesweeper *Bernicia*, attached to Tyne Division, visited Norway in June. The motor minesweeper *Mersey*, attached to Mersey Division, went to Nantes and St. Nazaire. Three motor launches from the Solent Division visited Bordeaux, La Rochelle, and St. Malo. *H.M.S. Humber*, seagoing tender of her Division, made a two weeks' cruise to five Norwegian and Danish ports. R.N.V.R. air squadrons underwent extensive training. They co-operated in one stage of the submarine exercise in the north-west approaches, making air strikes over 150 miles from base against units of the Home Fleet, including aircraft carriers and smaller ships. Whilst in June one squadron flew on to the light fleet carrier *Theseus* in the English Channel for a period of service afloat.

The R.N.V.R. air squadrons up to the present have been manned by officers who gained their flying experience in the war, but in future their strength will be maintained by the enrolment of young men who qualify as commissioned pilots and observers in the R.N. during their period of National Service.

In the New Year Naval Promotion Lists Hon. Commander Sir Arthur W. Jarratt was promoted to Hon. Captain R.N.V.R.

The Honorary rank of captain is very rarely given and is one of the most prized recognitions in the hands of the Board of Admiralty. There are only two other holders of it, H.R.H. The Duke of Gloucester and Sir Basil Brooke, Prime Minister of Northern Ireland.

ROYAL MARINES

On May 27 a farewell parade of the King's and Regimental Colours of the Royal Marines, Chatham Division, took place. Major-General R. A. R. Neville, C.B.E., R.M. (since appointed Governor and Commander-in-Chief of the Bahamas), Officer Commanding the Chatham Group, took the salute. On Sunday, May 28, the Colours were marched to Rochester Cathedral for laying up. In his sermon the Dean of Rochester, the Very Rev. T. Crick, a former Chaplain of the Fleet, said he hoped that some time in the near future another Dean might have the pleasure of handing back the Colours to the Marines.

The long association between Chatham and the Royal Marines ended at "Retreat" on August 31, when the Union flag was lowered for the last time at the R.M. Barracks.

In reply to a petition sponsored by the Chatham Borough Council and supported by the local authorities of Rochester and Gillingham, appealing to the Government to allow the Marines to remain, the Prime Minister stated that the Admiralty's decision to remove them to Portsmouth and Plymouth must stand.

On May 20, as a climax to their winter study of commando raids, a party of fifty R.M. officers, led by Colonel J. L. Moulton, D.S.O., O.B.E., R.M., visited the scene of the successful raid on Vaagso, Norway, by No. 3 Commando in December 1941.

The party sailed from Rosyth in H.M.S. Suvla which for the occasion was turned into a "School of Raiding" with lecture and model rooms in her Tank space. Officers from Combined Operations Headquarters were present as instructors and directing staff.

This visit was preceded on May 10 by an exercise in which Royal Marines from the Commando School at Bickleigh, Devon, scaled the high rocky cliffs near Salcombe, Devon. Marines from the Amphibious School at Fort Cumberland, Southsea, made the initial landing in canoes to set up guide lamps for the assault troops. The commandos disembarked on the rocky foreshore in total darkness. On the following day a similar exercise took place in daylight for the benefit of spectators.

During the Spring Cruise of the Home Fleet a small party of the R.M. Forces Volunteer Reserve embarked in Vengeance and Superb. This was the first occasion on which members of the R.M.F.V.R. had served afloat since the force was formed in 1948.

In June 1950 the 3rd Commando Brigade, R.M., moved from Hong Kong to Malaya to take part in the anti-Communist guerrilla campaign.

In August 1950 the 41st Royal Marine Commando Unit was formed for service in Korea. It arrived by air in Korea the following month and immediately went into action. It fought with great distinction in the break-out from the Changjin Reservoir area to the Port of Hungnam in December.

On May 25, 1950, Major-General W. I. Nonweiler, C.B.E., succeeded Major-General V. D. Thomas, C.B., C.B.E., as Chief of Staff to the Commandant-General, Royal Marines.

UNIFORM

It was announced by the Admiralty in March 1950 that as there was little possibility in the foreseeable future of reintroducing, even in modified form, the range of ceremonial uniforms worn up to the outbreak of World War II, it had been decided that such dresses and accessories as full dress, epaulettes, cocked hats, frock coat, etc., would no longer be worn, even if in the possession of officers. The "monkey jacket" or ordinary blue day uniform was to remain, and the mess undress and a modified form of mess dress were still to be worn. The latter comprised a white waistcoat, miniatures, and stars, but not the pre-war gold lace trousers.

In March 1951 a further announcement by the Admiralty stated that H.M. the King had approved a fundamental change in the distinguishing lace worn by officers of the Naval Reserves as marks of rank.

The distinctive lace of the R.N.R. and the wavy lace of the R.N.V.R. were to be abolished, with the exception that the latter would still be worn by officers of the Sea Cadet Corps and Combined Cadet Forces. Apart from this, all officers of the Reserve would in future wear lace similar to Regular officers of the Royal Navy.

MATERIAL

The new aircraft carrier H.M.S. Ark Royal was launched by H.M. the Queen at Birkenhead on May 3, 1950. It is hoped to complete the vessel in a little over two years. The new Ark Royal, while only slightly longer than her predecessor, sunk off Gibraltar in November 1941, has almost double the displacement, and her horse-power and fuel capacities are much greater.

In June H.M.S. King George V was towed to Gare Loch in the Clyde from Portsmouth for laying up. She was sealed up for preservation, being the first large ship to be treated in this manner.

Four 'Daring' class destroyers, Diamond, Defender, Dainty, and Delight, were launched during the year, bringing the total of these ships so far launched up to six. Two more are on the stocks. These ships are of all-welded construction, they displace 2,600 tons (3,500 tons fully loaded); the extreme length is 390 feet and beam 43 feet. The armament includes six 4.5-inch and six other guns, and two Pentad torpedo tubes above water. They are powered by geared steam turbines of an advanced design.

Speaking after the launching of H.M.S. Defender, the Third Sea Lord, Vice-Admiral Denny, said that these destroyers, the largest ever built for the Royal Navy, represented the most comprehensive and capable ships which human ingenuity could devise. But they might be the last which could be recognised as conventional destroyers. Smaller and lighter ships capable of dealing with any submarine threat would be built instead.

During the winter important structural tests were carried out at the

Naval Construction Research Establishment, Rosyth, on the hull of H.M.S. *Albuera*, an incomplete 'Battle' class destroyer which had been declared surplus after the war. The ship was supported amidships in dry dock and loaded at the ends by water ballast until complete structural failure occurred. As a result of these tests valuable data was obtained which it is hoped may lead to design methods aimed at combining lighter construction with superior strength.

A new survey ship H.M.S. *Cook* was accepted into the Service in July. She has an extreme length of 307 feet and beam of 38 feet. Her peace-time complement is eleven officers and 147 men. She is the fourth survey ship to be completed since the war, the others being *Dampier*, *Dalrymple*, and *Owen*.

Between May and November 1950 no less than eleven acts of malicious damage occurred in H.M. ships and establishments. The most serious of these was the explosion of several ammunition barges at *Bedenham* in Portsmouth Harbour on the evening of July 14. Fortunately, no one was killed, but fifteen men were injured. The explosion was started by a fire which broke out in a lighter which was being loaded with ammunition. The fire spread to the pier and other lighters, nine of which were sunk or damaged. There is little reason to doubt that this was a deliberate act of sabotage.

NAVAL AVIATION

A scheme has been introduced whereby National Service men can be trained as officer pilots or observers during their period of National Service. They will be entered as naval airmen and be promoted to Probationary Midshipmen (A), R.N.V.R., on commencing their flying training. On conclusion of their full-time National Service they must be prepared to join the permanent R.N.V.R. for not less than five years.

On June 20 two pilots of No. 702 Naval Air Squadron successfully landed 'Vampire' jet fighters at night in H.M.S. *Theseus*. These were the first night deck landings of jet aircraft. About the same time Lieutenant-Commander J. S. Bailey, O.B.E., R.N., created a world's record by completing his 2,000th landing on the deck of an aircraft carrier.

On October 16 four Sea Hornet aircraft of No. 809 Naval Air Squadron flew non-stop from Gibraltar to Lee-on-Solent. The flight, which was accomplished in three hours ten minutes, was the first formation flight of this type of twin-engined two-seater naval fighter aircraft from Gibraltar to England.

On November 8 the Vickers-Armstrongs Supermarine 510 jet fighter made its first deck landings on H.M.S. *Illustrious* in the English Channel. The machine, a research aircraft, was developed from the Attacker, and has both wings and tailplane swept back. The significance of the landing of such an aircraft on a carrier showed that with an accentuated sweep-back of as much as 40 degrees it was possible to maintain good handling qualities at low speed.

On December 10 three R.N.V.R. air squadrons co-operated with Territorial Army units and Royal Marines during an exercise in an area north of Chichester. This was the first occasion on which R.N.V.R. squadrons had co-operated with Territorials in a full-scale exercise.

The recruitment of maintenance ratings for R.N.V.R. squadrons which had previously been confined to men who had already served in the Naval Aviation Branch has been extended to include youths of 17 to 17½ years. They will be entered as junior naval airmen and air electrical ratings into the four R.N.V.R. squadrons based at the Royal Naval Air Stations at Abbotsinch, near Glasgow; Bramcote, Warwickshire; Stretton, Lancashire; and Culham, Berkshire.

FLEET CHANGES, EXERCISES, AND CRUISES

In March 1950 it was decided to place in Reserve during the ensuing twelve months three Fleet destroyers from the Mediterranean Fleet and four from the Home Fleet, and to replace them by nine anti-submarine frigates from the Reserve, with a head throwing anti-submarine weapons. The two Fleets would thus be provided with additional facilities for tactical training in anti-submarine measures.

In the autumn the cruiser H.M.S. *Superb* relieved H.M.S. *Glasgow* as flagship on the American and West Indies Station. The latter returned home for refit in company with the frigate H.M.S. *Snipe*. *Glasgow* had steamed 50,700 miles and called at 31 different ports, and *Snipe* had steamed nearly 90,000 miles and visited 145 ports during her commission.

Other changes in cruiser dispositions were Gambia to Mediterranean in relief of Newcastle in April; Ceylon to East Indies in replacement of Birmingham, also in April. On October 6 Belfast arrived at Chatham from the Far East; after taking part in operations in Korean waters, she had been relieved by Ceylon in August. In November the light fleet carrier H.M.S. *Triumph* returned to Portsmouth from the Far East, having taken part in operations in Korea. She was relieved by H.M.S. *Theseus*. In December the light fleet carrier H.M.S. *Glory* arrived at Plymouth from the Mediterranean to recommission for further foreign service. After the outbreak of war in Korea the light fleet carriers *Ocean* and *Warrior*, the latter from Reserve, were employed on trooping to the Far East.

Western Union exercises, with the code name "Activity," took place between May 22 and 30 during the Home Fleet's summer programme. British, French, and Dutch ships took part under the overall command of Vice-Admiral J. J. L. Willinge, Royal Netherlands Navy. The Home Fleet then worked gradually west-about round Scotland, and early in July visited ports in Scandinavia, the Netherlands, Belgium, and Germany.

In June the annual large-scale summer exercise for submarines, surface vessels, and aircraft under the direction of Flag Officer, Submarines (Rear-Admiral S. M. Raw, C.B.E.), took place in the north-west approaches. Fifteen submarines of home-based flotillas were engaged with three aircraft carriers, one cruiser, two depot ships, seventeen destroyers, twelve frigates, and aircraft of the Home Fleet, together with training flotillas from Portsmouth, Portland, and Londonderry and aircraft of Coastal Command.

Contrary to previous practice, the autumn cruise of the Home Fleet was based on Gibraltar instead of Scottish waters. In place of the aircraft carrier *Implacable*—under refit—the Commander-in-Chief (Admiral Sir Philip Vian) flew his flag in the battleship *Vanguard*, normally flagship of

the training squadron. Over twenty ships took part in the cruise, including the fleet carrier *Indefatigable* wearing the flag of Flag Officer, Training Squadron (Rear-Admiral St. J. A. Micklethwait), the light fleet carrier *Vengeance*, wearing the flag of Flag Officer Commanding, Third Aircraft Carrier Squadron (Rear-Admiral C. E. Lambe), and the cruisers *Swiftsure* and *Cleopatra*, the former wearing the flag of Flag Officer Commanding, Second Cruiser Squadron (Rear-Admiral C. A. L. Mansergh). The Fleet was joined for exercises by a squadron of the Royal Canadian Navy (one carrier, two destroyers) and ships of the French, Netherlands, and Portuguese Navies.

In February the Home Fleet again visited the Mediterranean and together with the Mediterranean Fleet and the United States Sixth Fleet carried out a series of exercises designed to cover convoy escort, night search and surface action, air attack, interception, and defence.

The Mediterranean Fleet and the United States Sixth Fleet had previously carried out joint exercises in July and August.

The Naval and civilian party which in February and March 1950 had carried out Arctic survival tests, arrived at Singapore in September to carry out tropical survival tests. One of the main objects of the tests was to estimate the best rations for castaways.

HONOURS AND AWARDS

For their courageous action and the splendid example which they set to their comrades the Albert Medal was awarded posthumously to Lieutenant F. J. Hindes, R.N., and Chief Engine-Room Artificer F. W. Hine, D.S.M., of H.M. Submarine *Truculent*. *Truculent* was sunk in the Thames estuary on January 15, 1950, after a collision. Lieutenant Hindes was first lieutenant of the vessel, and took charge of the escape arrangements in the after end. C.E.R.A. Hine took charge of escape arrangements in the engine-room. Both got clear of the submarine, but neither was picked up.

Two further awards in connection with the sinking of *Truculent* were also gazetted. These were a bar to the British Empire Medal to Petty Officer Cook (S) R. C. Fry, D.S.M., B.E.M., and the Medal itself to Engine-Room Artificer Second Class L. F. Stickland. P.O. Cook was a member of the engine-room party and instructed junior ratings in the use of their escape sets. E.-R.A. Stickland on his own initiative attempted to restore trim to the vessel by blowing tanks. He only left his post on a direct order from Lieutenant Hindes. Both men were eventually rescued.

A further award of the B.E.M. was announced in the case of Leading Electrician's Mate C. C. Anderson for his courage, skill, and determination, in saving H.M. Submarine *Sceptre* after she had been damaged by an explosion on August 8, 1949. L.E.M. Anderson entered the vessel knowing well that she was partially flooded and full of chlorine gas. He reached the pump-room, connected the main ballast pump, and gave her sufficient buoyancy to remain afloat.

On January 15, 1951, Admiral Sir Arthur J. Power, G.C.B., G.B.E., C.V.O., succeeded Admiral Sir Henry Moore, G.C.B., C.V.O., D.S.O., as First and Principal Naval A.D.C. to H.M. the King.

ADMIRALS OF THE FLEET

New rules for promotion to the rank of Admiral of the Fleet came into force in May 1950. The previous rules provided that three, and not more than three, of the holders of the rank should be of less than five years' seniority in the rank. The new rules provided that one promotion should normally be made at regular intervals of eighteen months and that vacancies arising from death would not be filled. By the new rules it is aimed to obtain a more even flow of promotion.

THE ARMY

The strength of the Active Army on April 1, 1950, was some 376,000 all ranks, the proportions of Regulars to National Servicemen being about even.

On the basis of strength alone this represented something approaching double the Regular Army of 1939. But in fighting strength there is little doubt that the Army of 1939 was at least equal if not stronger than the Army of 1950.

Yet our commitments had not decreased. Apart from responsibilities under the Brussels and North Atlantic Treaties, the Middle and Far East remained vital strategic areas, the latter alone absorbing the equivalent of about two divisions for the operations in Malaya and the defence of Hong Kong. It is true that India no longer remained a commitment, but against this must be offset the value of the late Indian Army, which in the past stood ready at hand as a strategic reserve to reinforce the Middle and Far East.

In reserve was the Territorial Army with a paper strength of twelve divisions but with an effective strength of about 86,000 as compared with the target figure of something over 400,000 which it was aimed to reach in 1954-55. Behind the Active and Reserve Armies lay the mass of Reservists, men and women who had served during and since the war either on National Service or as volunteers. The broad picture was, therefore, one of large manpower but relatively weak fighting strength available for immediate action. This weakness was further accentuated by the reserves of arms and equipment which for the most part comprised those left over from the war.

Faced with the Korean war and the deterioration in the international situation, the Government during the second half of 1950 and the opening months of 1951 decided on far-reaching measures. The barrel having been scraped to find a force of two brigades for Korea, steps were taken to maintain the strength of existing Active formations and to form new ones, to increase the state of preparedness of the Reserve Army, and to build up stocks of arms and equipment. These measures will take time to reach their full effect. The next two or three years will judge the effectiveness of their timing.

THE ARMY ESTIMATES

The Army Estimates for 1950-51, published on March 7, 1950, provided for a net expenditure of £299,000,000 compared with £304,700,000 in

1949-50, whilst the gross expenditure was shown as £341,600,000 compared with £356,200,000 for 1949-50.

They showed a total uniformed strength on April 1, 1950, of 376,400, being a reduction of about 40,000 compared with April 1, 1949. A further reduction of some 20,000 was forecast for the financial year 1950-51.

The figures for recruitment for the Regular Army showed a serious situation, for, although the estimated strength on April 1, 1950, was 185,000 (compared with 182,400 on April 1, 1949), the heavy wastage during the coming twelve months due to the termination of current engagements, particularly short-service and bounty engagements, was unlikely to be offset by new recruits, judging by the experience of the past three years and in view of the high rate of employment in civil life.

The unsatisfactory state of Regular recruitment meant that the un-economic policy of employing National Servicemen in the Middle and Far East would have to continue.

The strength of the Territorial Army and the Women's Royal Army Corps (T.A.) at the beginning of the year was 82,500, compared with 67,200 on January 1, 1949. The officer position was satisfactory, but the volunteer other ranks were far below requirements. The quality of volunteers, however, remained high.

In June 1950 the principal units of the Territorial Army received the first intake of National Servicemen who had completed their eighteen months training with the Regular Army. The extension of National Service to two years, however, interrupted this intake for a period of six months as from October 1.

There is not yet, therefore, sufficient data from which to judge the effect of this mingling of volunteers and National Servicemen in Territorial units.

The Estimates showed a decrease over the previous year in the sum allotted for stores. On the other hand, there was a substantial increase in the amount allotted for works, including a vote of just under £4,000,000 for new married quarters.

EMERGENCY MEASURES

Following on the outbreak of war in Korea, the War Office on August 3 issued an announcement calling for volunteers to enlist into the Regular Army for a period of eighteen months with the Colours, provided they were required for that period. It was intended that these men should serve in the Korean theatre. Applicants were confined to men under 30 years of age who had previously served at least eighteen months with the Colours and who had not been released or discharged prior to January 1, 1946. The numbers required were not large.

At the same time the War Office announced a new type of short-service engagement applicable to National Servicemen already with the Colours, whereby they could volunteer to stay an additional six months with the Colours after completion of their eighteen months. In addition, if such men wished to prolong their Colour service they could do so by engaging for three, five, seven, twelve, or twenty-two years without liability for further service in the Reserve. Gratuities for such re-engagements would be £50 for ten years' service and £25 for each additional year up to a maximum of £200.

With the introduction of the new rates of pay the rate of Regular recruiting showed a satisfactory increase, the figures of enlistments during the period September to December 1950 being about double those of the previous four months.

The decision to call up for fifteen days' training during the summer months some 235,000 Class "Z" Reservists elicited considerable discussion in Parliament and the Press.

According to the Minister of Defence there were two main reasons for this decision. First, to enable those men, who would be needed to fill up non-divisional units required to support the Regular divisions on the outbreak of war, to learn something of the role they would have to play in the event of mobilisation. Secondly, to improve the state of readiness of the Reserve (i.e. Territorial) divisions.

There were some critics who interpreted these reasons as mere verbiage to cover a "War Office Exercise" to test mobilisation plans. Others interpreted them as a rehearsal of mobilisation. The latter were probably nearer the truth, but it would appear that "the object of the exercise" was to cover a much wider front.

In the first place, consider the annual training of the Territorial formation and units. With their existing strengths of volunteers and National Servicemen it was impossible for them to carry out any but the most elementary forms of collective training. This applied especially to headquarters, from division down to units, which, without a reasonable proportion of their establishments of specialists, especially signalmen, are unable to perform their proper functions of command and control. Secondly, consider the individual. It was not to be anticipated that the Reservist officer or other rank would benefit greatly by his fifteen days' training as an individual, but as a member of a team it should undoubtedly ensure that in the event of mobilisation he would return to familiar surroundings and familiar comrades. Whilst as regards commanding officers, they should gain invaluable experience as to what to do and what to expect on mobilisation.

Finally, bearing in mind that all these "Z" Reservists have in the past been trained soldiers, some of them with war experience, their fortnight's training should enable them to refresh their memories as to lessons previously learnt and to familiarise themselves again with the weapons and equipment of their arm of the Service. To sum up, therefore, this call-up should increase the fitness and readiness of the Active and Reserve Armies for war. The weakness of the scheme lies mainly in the briefness of the period of call-up and in the decision that no man called up in the coming year (i.e. 1951) will be called up for similar training in subsequent years.

Following the decision to increase the fighting strength of the Regular Army, the following divisions started to re-form in the areas stated:

3rd Division	..	..	..	..	East Anglian District.
6th (Armoured) Division	..	..	..	..	Salisbury Plain District.
11th (Armoured) Division	..	..	..	..	Germany

In order to provide the Infantry for these divisions, all battalions employed in a training role had to be relieved of their duties and reformed as Active battalions.

ARMY COUNCIL

In April 1950 the Army Council consisted of:

The Right Hon. E. J. St. L. Strachey, President.
 Captain R. M. M. Stewart, Vice-President.
 Field-Marshal Sir William Slim, G.C.B., G.B.E., D.S.O., M.C.
 General Sir James Steele, K.C.B., K.B.E., D.S.O., M.C.
 General Sir Sidney Kirkman, K.C.B., K.B.E., M.C.
 Lieutenant-General N. C. D. Brownjohn, C.B., C.M.G., O.B.E., M.C.
 Lieutenant-General Sir John F. M. Whiteley, K.C.B., C.B.E., M.C.
 Sir George W. Turner, K.C.B.

On June 24 General Sir G. Ivor Thomas, K.C.B., K.B.E., D.S.O., M.C., succeeded General Sir Sidney Kirkman as Quarter-Master General, and on September 22 General Sir John T. Crocker, G.C.B., K.B.E., D.S.O., M.C., succeeded General Sir James Steele as Adjutant-General.

SENIOR APPOINTMENTS

The following appointments to the more important commands took place during the year on the dates given:

Commander-in-Chief, Middle East Land Forces:

General Sir Brian H. Robertson, Bt., G.B.E., K.C.M.G., K.C.V.O., C.B., D.S.O., M.C., A.D.C. (June 1950).

Commander, British Army Staff, Washington, and Military Member of the Joint Services Mission, Washington:

General Sir Neil M. Ritchie, K.C.B., K.B.E., D.S.O., M.C., A.D.C. (March 1950).

General Officer Commanding-in-Chief, Anti-Aircraft Command:
 Lieutenant-General C. F. Loewen, C.B., C.B.E., D.S.O. (May 1950).

Commander, Malaya District:

Major-General R. E. Urquhart, C.B., D.S.O. (February 1950).

Commander, 3rd Infantry Division:

Major-General Sir Hugh C. Stockwell, K.B.E., C.B., D.S.O. (January 1951).

Commander, 6th (Armoured) Division:

Major-General G. E. Prior-Palmer, D.S.O. (January 1951).

Commander, 11th (Armoured) Division:

Major-General H. R. B. Foote, V.C., D.S.O. (January 1951).

Commander 17th (Gurkha) Infantry Division, and Major-General Brigade of Gurkhas:

Major-General R. C. O. Hedley, C.B.E., D.S.O. (September 1950).

OBITUARY

During the year the Army suffered the loss of three Field-M Marshals—two of them outstanding figures who in their different spheres will go down to history as leaders and architects of the British Empire and Commonwealth.

On May 24, 1950, Field-Marshal the Right Hon. The Earl Wavell of Winchester and Cyrenaica, P.C., G.C.B., G.C.S.I., G.C.I.E., C.M.G., M.C., soldier, statesman, and author died. During the late war Field-Marshal Lord Wavell was successively Commander-in-Chief, Middle East, where his destruction of the Italian Armies in North and East Africa in 1941–42 will be recorded as a masterpiece of strategy, then Commander-in-Chief, India, and finally Viceroy of India in the crucial period of negotiations leading up to partition. As an author he will be best remembered for his brilliant biography of his former chief, Field-Marshal Lord Allenby, and for his history of the latter's Campaign in Palestine 1917–18. On June 7 Lord Wavell was given a State funeral in Westminster Abbey, the coffin being carried there by water from the Tower of London. Interment was subsequently carried out privately at Winchester.

On September 11, 1950, Field-Marshal The Right Hon. Jan Christiaan Smuts, P.C., O.M., C.H., D.T.D., E.D., D.Sc., L.L.D., K.C., died at his home in South Africa after a long illness.

“General” Smuts first gained distinction as a gallant and resourceful leader of commandos fighting against us in the Boer War. On the conclusion of hostilities he remained in South Africa to become the foremost statesman and politician of the new Dominion, of which he was for many years Prime Minister. During the World War I he sat as a member of the Imperial War Cabinet and in subsequent years he was recognised as an international statesman of unique and almost unrivalled repute, so much so that during the World War II his advice was freely sought by and as freely given to Mr. Winston Churchill on most occasions where matters of major policy were involved.

The third death to be recorded is that of Field-Marshal Sir Philip Chetwode, O.M., G.C.B., G.C.S.I., K.C.M.G., D.S.O., D.C.L., on July 6, 1950.

Sir Philip Chetwode will best be remembered as the Corps Commander under General Allenby in Palestine in 1917–18 who was responsible for the capture of Jerusalem and who took a leading part in the final stages of the victorious advance against the Turkish Armies. He subsequently became Commander-in-Chief, India, 1930–35. On the outbreak of World War II he took over the chairmanship of the Executive Committee of the Red Cross and St. John's Joint War Organisation, a position which he continued to hold until 1947.

TRAINING

For many years it has been peace-time practice to confine Army formation training to the summer and autumn months.

Last year there was a departure from this practice, when the 29th Independent Infantry Brigade carried out a three-day exercise in East

Anglia in November. At that time, no doubt, the brigade little imagined that a year hence they would find themselves launched into action in the severe conditions of a Korean winter.

This year a further winter exercise was held for five days in Germany, starting on December 6. In addition to units of the British Army of the Rhine, elements of the Danish and Norwegian Armies of Occupation participated, together with squadrons of the Royal Air Force.

It is as yet perhaps too early to judge fully the tactical lessons of the fighting in Korea, but a few points stand out clearly from the reports so far published. First, there is the necessity for troops to adapt themselves to the conditions of the country in which they are fighting and to the tactics of their enemy.

Korea is a country of few and poor communications and for the most part mountainous, except for the paddy-growing area on the west coast. Both the Chinese and North Korean Armies consist primarily of strong formations of lightly equipped Infantry, capable of a high degree of mobility on their feet by virtue of their toughness and ability to live on "a handful of rice."

Under these conditions British tactical doctrine appears to have been sound. Firmly based on lessons learnt long since on the North West Frontier of India and more recently in the jungles of Burma and Malaya, British troops have been able to discard their heavy equipment and vehicles and more than match the enemy on their feet and in the hills.

Such fighting calls for a high degree of initiative in junior leaders and the individual soldier, a high standard of weapon training, and in defence the determination to stand fast and fight it out, relying where necessary on supply by air until relieved.

Secondly, the old lesson of anticipating the enemy's intentions and capabilities by constant patrolling has stood out once more.

Thirdly, the necessity to withhold fire, especially at night, so as not to give away one's position prematurely and to ensure that every bullet finds a target, has proved itself time and again.

Finally, the tank has proved its value—in a country by no means favourable to its free employment—both by reason of its moral effect and as a supporting arm in the counter-attack. So far, however, the Centurion does not appear to have had the opportunity to prove itself in the tank versus tank battle.

THE TERRITORIAL ARMY

In the spring of 1950 the War Office published details of a major re-organisation affecting the Royal Armoured Corps, Royal Artillery, and Infantry of the Territorial Army.

Altogether 137 major and 47 minor units were involved, in part or in whole, in amalgamations which produced 67 major and 19 minor units. Four units of artillery were converted to other arms; 34 major and 41 minor units were transferred from the Territorial Army to the Supplementary Reserve, and 2 units were placed in suspended animation.

The Royal Artillery unit amalgamations included complications, such as combining a medium regiment and a heavy anti-aircraft regiment to form one heavy anti-aircraft regiment, and in another instance a light

anti-aircraft searchlight regiment and a mixed heavy anti-aircraft regiment were combined to form one mixed heavy anti-aircraft regiment.

In all 71 units of the Royal Artillery were amalgamated to form 34 units; and 10 Infantry battalions and 3 Artillery regiments were amalgamated to form 6 Infantry battalions.

Whilst in no sense questioning the necessity for these major changes in the roles and structures of Territorial units, one can only express a feeling of sympathy for the Territorial Army as a whole and the units concerned in particular, coming as they do on top of the far-reaching decision to depart from the policy of 100 per cent. volunteers, by the drafting of National Servicemen into the Territorial Army.

The drafting of these National Servicemen, on completion of their eighteen months' Regular service, started on July 1. As far as possible postings have aimed at placing the individual man in a unit within reasonable access of his home and of the same arm of the Service in which he had previously served. Where this has not been possible, as, for example, in the more thinly populated rural areas, the aim has been to employ a man in that trade or employment of which he has had previous experience in the Regular Army.

On joining their Territorial Army units National Servicemen are invited to accept the same training obligations as their volunteer comrades. In some units this invitation has been met with a heartening response, but it is as yet too early to judge the overall response and the general effect of the measure of compulsion introduced into Territorial Army service.

At the end of January 1951 the War Office launched a campaign with the object of effecting a much closer relationship between local authorities in London and the surrounding districts and their Territorial units. Under this scheme the Metropolitan boroughs and district councils were invited formally to adopt units and by the appointment of liaison officers and other means to ensure that the closest ties existed between the civil authorities and units. The scheme met with a ready response, and formal adoption ceremonies were held in all the principal boroughs and districts concerned.

If the initial impetus can be maintained the scheme will no doubt prove of considerable value to our citizen Army, and to the Volunteer Reserves of the Royal Air Force, to which it equally applies.

INFANTRY COMMANDERS' CONFERENCE

The Director of Infantry held the biennial Infantry Commanders' Conference from October 6 to 13. The Conference opened at the War Office with an address by the Chief of the Imperial General Staff. It continued at the School of Infantry, Warminster.

Representatives from all Commands at home and overseas attended, and in addition the Dominion and Commonwealth countries were represented, together with representatives of the United States Army. The programme included a discussion on the infantry aspects of the C.I.G.S's. Camberley Exercise "Horatius," and demonstrations of the latest tactical training and weapon development, together with a comprehensive agenda on subjects of current interest.

ARTILLERY DEMONSTRATION

Some thousands of officers, cadets, and other ranks of all three Services, together with officers from the Dominions, the United States, and other nations, witnessed the annual artillery demonstration, named "Scapa," at the School of Artillery, Larkhill, on May 9.

THE WOMEN'S SERVICES

In April 1950 the War Office announced that Army titles of rank would be given to officers of the Women's Royal Army Corps and Queen Alexandra's Royal Army Nursing Corps.

H.R.H. the Princess Royal, whose previous rank in the W.R.A.C. was Chief Controller, thus becomes the first woman to hold the rank of Major-General in the British Army. The heads of both Services at the War Office assumed the rank of Brigadier. On April 20 the War Office announced that volunteers for the Women's Royal Army Corps (Territorial Army) would be enlisted at 17½ years of age instead of at 18 years. Between 17½ and 18½ years of age volunteers are required to have the consent of both parents (or guardian). The upper age limit remained unchanged at 40.

THE BRIGADE OF GURKHAS

On the formation of the Brigade of Gurkhas in 1948 it was decided that the officer cadre should be found from British officers of Gurkha regiments transferred from the late Indian Army with the addition of officers seconded from British Infantry regiments. Under this arrangement the former category would eventually fade out, leaving only seconded officers together with such Gurkha personnel as might in due course be found suitable to hold the King's commission.

This scheme has now been superseded. In future each Gurkha Rifle Regiment will be built up to a strength of thirty-six Regular British officers commissioned into the regiment. The remaining requirements will be met by seconding officers from British Infantry regiments, as at present.

Officers appointed on first commission from the Royal Military Academy will be entitled to normal pay and allowances with additions for Gurkha Service and language, but will be required to serve for their first twelve months with a British Infantry battalion in the United Kingdom or Europe. This follows closely the former pattern of training of the British officers of the Indian Army.

Seconded officers, whose normal tour of two years may be extended, will be drawn from (a) Infantry officers of the substantive rank of major or below who hold Regular or short-service commissions and who have sufficient unexpired service to complete a tour of three years, and (b) officers of arms other than Infantry who were born on or after January 1, 1924, and who have strong family connections with Gurkha regiments. Seconded officers will be eligible for temporary promotion. In future, also, staff appointments outside the Far East Land Forces will be open to officers commissioned directly to Gurkha rifle regiments and to officers seconded to them.

His Majesty the King has been graciously pleased to approve that the

2nd Regiment of the Brigade of Gurkhas shall retain its former (Indian Army) title of "2nd King Edward VII's Own Gurkhas Rifles (The Sirmoor Rifles)," and that the additional title of "Princess Mary's Own" be included in that of the 10th Regiment, which in future is to be designated "10th Princess Mary's Own Gurkha Rifles."

SUSPENSION OF RELEASES

Following the outbreak of war in Korea the War Office announced that the release of all Regular Army personnel, with the exception of National Service personnel and certain other categories mentioned below, would be temporarily suspended with effect from August 1. In addition there was a limited selective call-up of the Regular Army Reserve and the Regular Army Reserve of Officers. These instructions applied to:

- (1) Regular officers. All voluntary retirement was suspended, unless already approved by the War Office.
- (2) Short-service officers with a Reserve liability.
- (3) Regular other ranks, except those due for release on pension.
- (4) Men on short-service engagements.
- (5) Discharge by purchase, except in the case of compassionate grounds.

TROOP MOVEMENTS

The decision to form three additional divisions and one independent brigade (of which two divisions are to be stationed in Germany) necessarily entailed considerable regrouping of units. The consequent movements started in January 1951 and were scheduled for completion by April 1, on which date the new formations are due to be raised. All infantry battalions previously employed in a training role have had to be relieved in order to complete the new formations. At the time of writing no official intimation has been issued as to whether it is proposed to re-raise the second battalions of Regular Infantry regiments.

HONOURS AND AWARDS

On January 5 it was announced in a Supplement to the London Gazette that His Majesty the King had been graciously pleased to approve the posthumous award of the Victoria Cross to:

Major Kenneth Muir, The Argyll and Sutherland Highlanders (Princess Louise's). The citation stated:

On September 23, 1950, "B" and "C" Companies of the 1st Battalion, The Argyll and Sutherland Highlanders, who were taking part in a general advance across the Nakdong River to Songju, attacked an enemy-held feature, Hill 282.

Major Muir, Battalion Second-in-Command, although only visiting the position, took over command of the two companies after they had become inextricably mixed following heavy casualties and, with complete disregard for his own safety whilst repeatedly under fire, moved round the forward elements encouraging the men to greater effort. The companies subsequently suffered further heavy casualties as a result of an attack made in error by American aircraft, which led to a withdrawal some fifty feet below the crest.

Major Muir, realising that the enemy had not taken immediate advantage of the incident, personally led a counter-attack with a small force of some thirty all ranks and retook the crest. In the subsequent defence, having used a 2-inch mortar with great effect against the enemy, and though mortally wounded, he was still determined to fight on.

The effect of his splendid leadership upon the men was amazing, and it was entirely due to his magnificent courage and example, and the spirit which he imbued in those about him, that all wounded were evacuated from the hill and, as was subsequently discovered, very heavy casualties inflicted on the enemy in the defence of the crest.

During the year a number of other awards for gallant and distinguished services in both Korea and Malaya were gazetted.

On October 21, 1950, General Sir John Harding, K.C.B., C.B.E., D.S.O., M.C., was appointed A.D.C. General to His Majesty the King vice General Sir James Steele, G.C.B., K.B.E., D.S.O., M.C., LL.D.

PRESENTATION OF COLOURS

On July 5 His Majesty the King presented Colours to the 3rd Battalion, Coldstream Guards on Horse Guards Parade. Two weeks later, accompanied by Her Majesty the Queen, His Majesty presented Colours to the three Regular battalions of the Parachute Regiment at Aldershot.

On September 23 The Princes Royal, Colonel-in-Chief, presented Colours to the 8th Battalion, The Royal Scots (T.A.) at the Depot, Glencorse; and on September 24 Her Royal Highness presented a new King's Colour to the 4th Battalion, The Green Howards (T.A.) at Middlesbrough.

New Colours were presented to the 1st Battalion, The Duke of Cornwall's Light Infantry by Lieutenant-Colonel E. H. W. Bolitho, Lord Lieutenant of Cornwall, at Bordon Camp on June 9. It was the first time that the Colours of the 1st and 2nd Battalions, which were amalgamated at the ceremony, had been on parade together

WAR MEMORIALS

SANDHURST

Memorials to the officers of the British and Commonwealth Armies and to all ranks of the Indian Army who died in the World War II were dedicated in the Royal Military Memorial Chapel at the Royal Military Academy, Sandhurst, on October 27, in the presence of His Royal Highness the Duke of Gloucester, Colonels Commandant of Corps and Regiments, Colonels of Regiments, senior officers of the late Indian Army, and Dominion, Commonwealth, and Colonial representatives.

The first memorial takes the form of the reseating of the whole nave and choir with oak pews, upon which the crests or badges of corps and regiments have been carved and given their heraldic colours. Later, a Book of Remembrance inscribed with the names of all commissioned officers of the British and Commonwealth Armies who died will be placed in the chapel. The separate Indian Army Memorial consists of the reconstructed organ, a decorative organ screen, and a chapel beneath the existing organ loft. Flanking the entrance to the chapel are two brick piers faced with oak, on which are mounted sixty-seven regimental badges of the Indian Army, carved in limewood. The screen, which is also of oak, fronts an

existing window in a frame of light. It bears twelve corps badges in pearwood, crowned by the Star of India carved in limewood and gilded.

EIGHTH ARMY

The stained glass window designed to be placed at the east end of the Lady Chapel of Cairo Cathedral as a memorial to the Eighth Army was placed on view in the Victoria and Albert Museum, South Kensington, from September 21 to October 18, 1950.

The window was subsequently shipped to Cairo and was unveiled in the Cathedral on March 4, 1951, by Field Marshal Viscount Montgomery and dedicated by Bishop Gwynne, formerly Bishop of Egypt and the Sudan.

CAPTAIN-GENERAL, ROYAL REGIMENT OF ARTILLERY

On January 12 the title of Colonel-in-Chief, the Royal Regiment of Artillery, was, with His Majesty's approval, changed to that of Captain-General, the Royal Regiment of Artillery.

The present holder of the title is His Majesty the King.

THE ROYAL AIR FORCE

"The number of men (240,000) in the Air Force on April 1, 1950, will be about 10,000 below the planned figure, but little further change during the year is contemplated.

"The plan for doubling the jet fighter strength of Fighter Command will be completed and the power of Bomber Command will be increased by forming squadrons of B.29 aircraft as a result of American aid."

This extract from the "Statement on Defence 1950"* pointed to both the weakness and the strength of our air power.

The weakness lay in manpower, of which just over one-third were National Servicemen; in the insufficiency of Regular personnel required not only to provide the skilled tradesmen to maintain existing squadrons but also to train and administer the National Service element; in the small number of operational squadrons compared with the total manpower engaged; and in the lack of bomber aircraft. The strength lay in our growing fighter force and in the firm foundation for expansion based on the skill and ingenuity of our scientists, designers, and technicians, and on the soundness of training methods and traditions of the Royal Air Force. To use a vulgarism, "we can produce the goods." It remains to be seen whether we can produce them in time. Under the Three Year Defence Programme the wheels of production and expansion have been set in motion; on the momentum which they can gather during the next year or two much will depend.

THE AIR ESTIMATES

The Air Estimates for 1950-51 provided for a net expenditure of £223,000,000, being an increase of £15,550,000 over the amount allotted for the previous year.

* Cmd. 7895.

The Estimates showed a total uniformed strength on April 1, 1950, of 202,400, which was about 10,000 below the planned figure, and 22,500 less than the strength on April 1, 1949.

The shortage of Regular recruits remained a serious problem. The proportion of Regulars to National Servicemen was approximately three to two.

In introducing the Estimates the Secretary of State for Air (Mr. Arthur Henderson) stated there was to be a further reduction in strength during the year to bring the figure down to 198,000.

Referring to equipment, he said that the doubling of the strength of Fighter Command's jet fighter force was proceeding, and that with the exception of squadrons operating in the Far East all day fighter and ground attack squadrons overseas had been equipped with jet aircraft.

Of the twenty Royal Auxiliary Air Force fighter squadrons, eight had already been equipped with jets, and a further eight would be re-equipped during the next twelve months. Orders had been placed for the production in quantity of the Venom, which had a higher performance as regards speed, rate of climb, and ceiling than the Vampire. In turn the Venom would be followed by jet fighters of still more advanced types, capable of speeds well over 600 m.p.h. and capable of operating at extreme altitudes. These machines were under development.

A new jet night-fighter was now in production in sufficient quantity to re-equip and expand the existing night-fighter force.

Continuing, the Secretary of State said that our bomber force would become substantially larger during the coming months, and its effective striking power would be greatly enhanced by the arrival of seventy American B.29 aircraft which were due in the near future and which would be followed by a further number at a later date.

Furthermore, the Canberra twin-jet bomber had successfully completed its initial flying trials, and it was hoped that it would be in service with the squadron in 1951.

In order to meet the increases in Fighter and Bomber Command it would be necessary to reduce Transport Command still further.

Dealing with research and production, he stated that work was being carried out on the design of an air-to-air guided missile for use in fighters, and that extensive modernisation of the report and control systems for the defence of Great Britain had taken place.

After referring to the critical position as regards Regular recruiting, and the efforts which were being made to provide better accommodation, Mr. Henderson concluded by saying that it was his conviction that the period of acute danger to the future of the Royal Air Force was over, and that they could look forward, as both accommodation and career prospects improved, and as new aircraft and equipment came forward to squadrons, to a period of consolidation and of increasing operational efficiency and continued expansion.

Reviewing the Estimates as a whole, it may be said that they revealed a not unsatisfactory picture as regards our fighter strength but serious deficiencies in the effective strengths of both bomber and transport squadrons. In particular, the unsatisfactory position as regards Regular recruiting coloured the whole picture in sombre tones. The most encouraging feature lay in our research and development programme and achievements. In the jet-engined field we still led the world.

EMERGENCY MEASURES

Following on the outbreak of war in Korea the Royal Air Force, in common with the other two Services, took steps to retain temporarily in the Service Regular personnel due for release. Reservists, however, were not recalled.

Under the Three Year Defence Programme the Minister of Defence (Mr. Shinwell), speaking in the House of Commons on February 15, 1951, announced that provision for the R.A.F. would be nearly doubled. There was to be a further major expansion of Fighter Command; the day-fighter force which had already been doubled was to be doubled again, and the Venom was to reach squadrons during 1951. In addition it was proposed to acquire a number of American F.86 Sabre jet fighters—the fastest fighter yet in production. There was also to be a large increase in night-fighters. The strength of Coastal Command was to go up, whilst the run-down of Transport Command was to cease.

Continuing, Mr. Shinwell stated that production of the Canberra bomber would be greatly accelerated, and that “the formation of squadrons of this type would begin shortly.” He further announced that several new squadrons had already been formed in Germany and that more would follow. There were to be similar increases in the Middle East. The chain of radar stations required for the defence of Great Britain was also being increased.

Out of this series of vague statements which presumably were designed to convey the minimum of information to those outside official circles, one item of special interest emerged. The Minister stated that the first production order for a four-engined jet bomber had already been placed. This aircraft would be faster than the Canberra, which itself has a speed of over 500 m.p.h.

Some further information was given by the Secretary of State for Air in the House of Commons on March 6, when he revealed that of the sum allocated to the Forces under the three-year programme more than one-third would be spent on the Royal Air Force. Out of the increased production of aircraft much would have to be used for forming new squadrons rather than for re-equipping existing squadrons. Re-equipment of fifteen of the auxiliary fighter squadrons with Meteors and Vampires had, however, already been carried out and the remaining squadrons would receive Vampire V's in time for their three months' continuous training in the summer. Speaking of personnel, Mr. Henderson emphasised that the whole programme depended on a sufficiency of pilots and navigators of the highest quality.

Herein lies the crux of the whole programme. Whilst the entry to Cranwell is now much more satisfactory, the number of university candidates coming forward for Regular commissions is below requirements. Whether the new pay rates and improved accommodation will provide the necessary incentives for young men to join the Service as a career remains to be seen, but it appears to be doubtful. Probably the greatest deterrent against officer recruiting is the comparatively early ages of retirement coupled with the difficulty of finding civil employment in middle age. This is an urgent problem affecting all three Services, in which so far no satisfactory solution has been found.

The fulfilment of the programme also depends on the enlistment of sufficient Regular airmen needed to cover the necessary structure of highly skilled trades. Here there are signs that the new rates of pay coupled with the agreements with technical trades unions, whereby certain R.A.F. trades carry eligibility for admission into those unions, will prove effective.

Finally, the programme still leaves open to doubt whether adequate provision is to be made to equip the Royal Air Force with a strategic force of long-range bombers capable of carrying war to the heart of the enemy. For, after all, offensive action still provides the most potent form of defence.

THE AIR COUNCIL

On April 1, 1950, the Air Council consisted of:

The Right Hon. Arthur Henderson, K.C., M.P.

Air Chief Marshal Sir John Slessor, G.C.B., D.S.O., M.C.

Air Chief Marshal Sir Leslie Hollinghurst, K.C.B., K.B.E., D.F.C.

Air Chief Marshal Sir William Dickson, K.B.E., C.B., D.S.O., A.F.C.

Air Chief Marshal Sir R. Victor Goddard, K.C.B., C.B.E.

Air Chief Marshal the Hon. Sir Ralph Cochrane, K.C.B., K.B.E., A.F.C., A.D.C.

Air Marshal Sir Arthur P. M. Sanders, K.B.E., C.B.

Air Marshal J. N. Boothman, C.B., D.F.C., A.F.C.

Aidan Crawley, Esq., M.B.E., M.C.

Sir James H. Barnes, K.C.B., K.B.E.

During April Air Marshal Sir W. Alec Coryton, K.C.B., K.B.E., M.V.O., D.F.C., succeeded Air Marshal Boothman as Controller of Supplies (Air), Ministry of Supply.

As from February 1 the departments of the Air Member for Supply and Organisation and of the Air Member for Technical Services were combined, so that the equipment and engineering staffs should be under the control of one member of the Air Council. Air Chief Marshal Sir William Dickson took charge of technical services whilst remaining Air Member for Supply and Organisation.

SENIOR APPOINTMENTS

The following appointments to the principal Commands took place during the year on the dates given:

Air Officer Commanding-in-Chief, Flying Training Command:

Air Marshal Sir Hugh S. P. Walmsley, K.C.I.E., C.B., C.B.E., M.C., D.F.C. (March).

Air Officer Commanding-in-Chief, Transport Command:

Air Marshal Sir Aubrey B. Ellwood, K.C.B., D.S.C. (March).

Commandant-General of the R.A.F. Regiment:

Air Vice-Marshal S. C. Strafford, C.B., C.B.E., D.F.C. (October).

Air Officer Commanding, Malaya:

Air Vice-Marshal R. S. Blucke, C.B., C.B.E., D.S.O., A.F.C. (January).

In September Air Chief Marshal Sir Alec Coryton became the first incumbent of the new appointment of Chief Executive, Guided Weapons, Ministry of Supply.

On June 8 Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C., Chief of the Air Staff, was promoted to the rank of Marshal of the Royal Air Force.

TRAINING

The first large-scale Western Union Air Exercise, named "Cupola," was held from August 25 to 27. Air Chief Marshal Sir James Robb, C.-in-C. Air Forces, Western Europe, was in overall control, with Air Vice-Marshal W. A. D. Brook as Chief of Staff. The main object of the exercise was to test the joint working of the communications in France, Belgium, and Holland. Since the Western Union Defence Organisation was formed in 1948 English has been adopted for the direction and interrogation of pilots; British training methods and operational procedure have been introduced; and British radar equipment and control and reporting systems have been used. Moreover, the French Air Force have been equipped with Vampires, and the Dutch and Belgian Air Forces with Meteors, whilst an organisation similar to our Royal Observer Corps is being formed in France, Belgium, and Holland.

The attacking forces comprised R.A.F. Mosquitoes and Wellingtons and U.S.A.F. Super-fortresses. The main attacks were directed on Paris, Brussels, Rotterdam, and Amsterdam. The defending forces consisted of R.A.F., French, Belgian, and Dutch fighter squadrons.

A combined R.A.F. and Anti-Aircraft Command exercise, "Emperor," was held over England and Wales between October 7 and 15 under the direction of the A.O.C.-in-C., Fighter Command, Air Marshal Sir Basil Embry. The main purpose was to test the air defence organisation and to give Bomber Command crews experience in attacking defended targets. The attacking forces were directed by the A.O.C.-in-C., Bomber Command, Air Marshal Sir Hugh P. Lloyd, and the Commanding General, 3rd Air Division, U.S.A.F., Major-General Leon W. Johnson.

Aircraft participated from R.A.F. Fighter, Bomber, and Flying Training Commands, the British Air Forces of Occupation in Germany, and the Middle East Air Force. Air fighter squadrons of the R.Aux.A.F. also took part together with U.S.A.F. squadrons and squadrons from the Western Union countries.

Regular and T.A. units of A.A. Command, the Royal Observer Corps, and Fighter Control units of the R.Aux.A.F. were also engaged.

During the year several special flights were carried out by the newly established R.A.F. College at Manby, Lincolnshire. In June a Lincoln carried out high-altitude tests over the Arctic Ocean, flying 2,000 miles non-stop from Godhaven in Greenland. The following month another Lincoln made a navigational flight over the North Pole.

In October two Lincolns flew to Canada by way of Iceland and returned via the Azores, whilst a third flew to Alaska via Iceland and on arrival carried out a fifteen-hour flight of 2,500 miles in the Arctic Circle. Another Lincoln—the famous Thor II—visited U.S.A.F. and United States Naval air bases in America.

In October also the "Aries III" in the course of a round-the-world

flight from west to east covered the distance from London to Khartoum at the record speed of 213 m.p.h.

R.A.F. DISPLAY

The R.A.F. Display, last staged at Hendon in 1937, was revived at Farnborough on July 7 and 8. The flying programme included individual and formation acrobatics by Meteors and Vampires, "crazy" and precision formation flying, and demonstrations of the new Venom jet-fighter-bomber and the Canberra twin-jet medium bomber. The programme concluded with a fly-past in which six Commonwealth countries, the U.S.A.F., and the French, Belgian, and Netherlands Air Forces joined the R.A.F.

This display and the display organised by the Society of British Aircraft Constructors—also held at Farnborough—attracted many overseas visitors and showed that the achievements and performance of the R.A.F. and the British aviation industry were worthy objects of pride for every Englishman.

EQUIPMENT

The seventy B.29's allotted to Bomber Command under the Atlantic Pact mutual arms aid agreement started to arrive during the early summer. They were based on Marham, Lakenheath, and Sculthorpe alongside squadrons of the U.S. Third Air Division. They will be known as Washingtons in the R.A.F.

Other new aircraft accepted into the Service were the Boulton and Paul Balliol and Avro Athena trainers. Designed to the same specification for a two-seater applied flying trainer, they are both powered by Rolls-Royce "Merlin" engines.

Since early in the year three ambulance helicopters have been in regular use by the R.A.F. for the evacuation of casualties from the jungle in Malaya.

Two new jet night-fighters were on show at the S.B.A.C. Display in September. These were the de Havilland Venom N.F.2 and the Armstrong-Whitworth-Gloster Meteor N.F.II. The former is a development of the high-altitude fighter of the same name, and the latter is a combination of the Meteor VIII day-fighter and the Meteor VII two-seater trainer.

Another aircraft of special interest at the S.B.A.C. Display was the Gloster Meteor ground-attack fighter, named the "Reaper." It can carry either four 1,000-lb. bombs, sixteen 95-lb. rockets, 580 gallons of extra fuel in auxiliary tanks, or a combination of these. It has provision for rocket-assisted take-off to permit its use on improvised airfields.

Two outstanding flights were performed during the year. On May 12, 1950, a Gloster Meteor jet fighter, piloted by Squadron Leader J. Cooksey, won the 1,000-kilometre closed-circuit international speed record with an average speed of 510.92 m.p.h. On February 21 a Canberra B.2 bomber with a crew of three commanded by Squadron Leader E. A. Callard crossed the Atlantic from Aldergrove to Gander in 4 hours 40 minutes. For most of the crossing the aircraft flew at over 40,000 feet. The object of the flight was to hand over the aircraft to the U.S.A.F. for tests, with a

view to the Canberra being built in America for the U.S. Tactical Air Command.

ORGANISATION

Reserve Command has now been renamed Home Command, and reorganised into seven regional Groups, corresponding to the Army Commands. This will facilitate co-operation in matters of home defence. The new command has taken over responsibilities for the control of medical units and recruiting centres, administrative control of the R.A.F. Record Office, and control of a variety of units previously administered by Technical Training Command.

The main objects of the reorganisation are to relieve operational Commands of administrative responsibilities and to further decentralisation from the Air Ministry.

PERSONNEL

On July 1, 1950, the first National Servicemen, on completion of their eighteen months' full-time service, entered "H" section of the R.A.F. Reserve for a period of four years, during which they will be liable for training up to a maximum of sixty days.

Training pilots will continue their flying training as members of the R.Aux.A.F. squadrons or at Reserve Flying Schools. A limited number of National Service radar officers and all men in ground trades are invited to volunteer for the R.Aux.A.F. or the R.A.F.V.R., whilst a certain number of officers and warrant officers are similarly invited to volunteer for training duties with A.T.C. units; in both cases these duties will count in lieu of Class "H" Reserve obligations.

With the extension of the whole-time period of National Service to two years as from October 1, 1950, the intake to "H" Reserve temporarily ceased. Comment on the working of the scheme would, therefore, be premature at this stage.

The rank titles for aircrew introduced soon after the war, whereby a sergeant-pilot was designated Pilot II, have been abolished; in lieu sergeant's rank will be granted to every member of an aircrew when he receives his wings, and the titles will be coupled with the appropriate aircrew designation. For the top rank, however, the existing titles of Master Pilot, Master Signaller, etc., are to be retained.

WOMEN'S ROYAL AIR FORCE

On July 1, 1950, Air Commandant N. M. Salmon, O.B.E., succeeded Air Commandant Dame Felicity Hanbury, D.B.E., A.D.C., as Director of the W.R.A.F.

Under an exchange scheme a small number of W.R.A.F. officers have been posted to U.S.A.F. establishments in America, and a number of U.S.W.A.F. officers have been posted to R.A.F. establishments in Great Britain.

Women who hold a pilot's licence are now eligible to join the W.R.A.F.V.R. as pilots. They will be used for non-combatant flying duties in war, such as ferrying and communication flying.

Women candidates are also eligible for short-service commissions in the Fighter Control Branch of the R.A.F. Commissions will be for five years' Regular and four years' Reserve service.

Princess Mary's Royal Air Force Nursing Service has now been made part of the Royal Air Force, whilst retaining its title and designation. In effect this means that officers will be commissioned into the R.A.F. and become subject to King's Regulations and the Air Force Act subject to certain modifications. Nursing officers now carry the rank titles as officers of the R.A.F.

H.M. the King has appointed H.R.H. the Princess Royal, C.I., G.C.V.O., G.B.E., Air Chief Commandant of the P.M.R.A.F.N.S.

RESERVE FORCES

Following a decision to accept the offer of the British Air Charter Association to place aircraft and crews at the disposal of Transport Command in an emergency, the first auxiliary squadron of that Command was formed at Blackbushe on December 15.

Three new University Air Squadrons, R.A.F.V.R., are also to be formed at Bristol, Hull, and Liverpool.

On September 1, Air Commodore F. Crerar, C.B.E., was appointed the first Inspector of the R.Aux.A.F. The creation of this appointment reflects the growing importance of the part played by the auxiliary squadrons in the defence of Great Britain.

The growing importance of the Air Training Corps and the Air Section of the Combined Cadet Corps is reflected in the scholarships provided by the Air Ministry and the Air League. Winners of these scholarships receive free flying training up to the standard set for a private pilot's licence, after which they may continue training at Reserve Flying Schools as aircrew of the R.A.F.V.R. pending their call-up for National Service.

On June 21 H.M. the King presented the Esher Efficiency Challenge Trophy to No. 604 (County of Middlesex) Squadron, R.Aux.A.F., at Buckingham Palace.

HONOURS AND AWARDS

In recognition of his courage and initiative in rescuing two airmen from a blazing flying-boat at the R.A.F. Station, Calshot, on February 23, 1950, the George Medal was awarded to Leading Aircraftsman P. F. Anderson, R.A.F.

H.M. the King has approved the grant of the Royal title to the Reserve of Air Force Officers, which in future will be known as The Royal Air Force Reserve of Officers.

Air Marshal Sir William Elliot, K.B.E., C.B., D.F.C., succeeded Air Chief Marshal Sir John Slessor, G.C.B., D.S.O., M.C., as Air Aide-de-Camp to H.M. the King.

THE ROYAL OBSERVER CORPS

The Royal Observer Corps celebrated its Silver Jubilee in April. In 1925, when it was formed, its members were Special Constables detailed to undertake aircraft observation under the operational control of the

War Office, which had taken over the reporting organisation brought into action by the Admiralty and the Home Office in the 1914-18 war.

In 1929 the Air Ministry took over operational control of the Corps from the War Office, and ten years later administrative control from the Home Office. During the 1939-45 war membership rose to 32,000, including 4,300 women.

For its outstanding work in the Battle of Britain the Corps received the Royal title—an unprecedented honour for a civil body in war-time. H.M. the King has now further honoured the Corps by accepting the position of Air Commodore-in-Chief, R.O.C., and by introducing an R.O.C. Medal for Long Service.

D. A. L. WADE



An Air Drop in Korea



An Air Drop in Korea

CHAPTER III

WESTERN DEFENCE

THIS CHAPTER was written in the spring of 1951 and therefore only deals with the situation as it was at that time. No doubt great advances will have been made by the time of publication. We are, however, concerned with the erection of an edifice upon foundations already well and truly laid. Between spring and autumn the walls will grow higher, but the plan and elevation remain constant. It would indeed be a disaster if they were to be changed and building to start again on fresh foundations. The measure of the progress made in the spring of 1950 is at once apparent if we look back at Chapter IV of "Brassey's Annual" for that year and compare the situation as it was then with the present organisation as revealed in the White Paper published in April 1951 (see Reference Section). The main weakness in the organisation is perhaps a surfeit of committees.

Now we have General Eisenhower once more in Supreme Command with Lord Montgomery as his Deputy. There had been no change of plan, there has merely been an extension and development of the previously existing plan. The new Supreme Commander has started off from the point on the road already marched by the organisation set up by the Treaty of Brussels and he marches in the same direction.

The terrain to be dealt with is so huge that decentralisation was clearly necessary. The division into three areas, northern, central and southern, suffices for the present. The central area, consisting of Western Germany, the Benelux countries, and France is the keep, the loss of which would be disastrous, though, as the last war proved, not necessarily decisive. Here will be the greatest concentration of forces under the direct control of the Supreme Commander himself. In view of the geographical position of France as the backbone of the keep, it is reasonable that the command of the land forces of the central area should be in the hands of a Frenchman.

The northern area, consisting of Scandinavia, the Baltic, and the North Sea, is equally reasonably to be commanded by a British Admiral, Sir Patrick Brind, with an American in command of the Air, and the Danish and Norwegian Armies under their own commanders.

At the time of writing the set-up of the southern area is still undetermined. It is clearly a much more complex problem than is the case with the other two. Presumably it will comprise Austria, Italy, and North Africa. Clearly it is inextricably bound up with the question of the defence of the Mediterranean, mainly a Naval and air problem. The Mediterranean must surely be treated as a whole.

What is the role of Portugal in Western defence? Will she come under the central or the southern area? Presumably her main contribution will be to supply Naval and air bases for forces engaged in the Battle of the Atlantic, and in this to some extent making good the gap left by the absence of Eire from the Atlantic Treaty. If Spain was a participant in the plan, both she and Portugal would clearly fall into the central group. In her present isolated position Portugal seems to fall more naturally into

the orbit of the Atlantic Command than into any of the three areas under General Eisenhower.

The strategic importance of Great Britain in any system of defence for Western Europe is obvious. The facts of history have proved that for many centuries this island was rendered inviolable thanks to "the silver sea, which serves it in the office of a wall." Its security has been lessened in modern times by man's conquest of the air and the development of long-range missiles. Its importance as a base for sea, land, and air operations for the defence of Western Europe remains, however, unimpaired. The problem is to give it the highest possible degree of security against air and long-range missile attack. It forms a link between the northern and central areas, and its defence falls within the orbit of both. It is in effect a second keep. The northern and central areas form its outer defences, but clearly its last ditch defence must be a purely British responsibility. So long as the command of the sea rests in Western hands, this will be mainly a question of anti-aircraft defence, long-range missiles being in this context the equivalent of aircraft. It will be liable also to airborne attack. Defence against this may be primarily based on a Home Guard, but a mobile striking force of well-trained troops will also be necessary. Finally, it is of course clear that it is not Great Britain alone but the British Isles as a whole which are important to Western European defence. The gap left by the neutrality of Eire seriously complicates the problem of protecting the Western Approaches.

The northern area is likewise weakened by the regrettable decision of Sweden not to sign the Atlantic Treaty. Her particular difficulty is dealt with later in this article. At the same time there is no doubt as to what she would do if attacked and she has set her defences in order. But, should the course of a future war drive her into the arms of N.A.T.O., she would come as a stranger without previous co-ordination of plan or tactical doctrine. But, whatever line Sweden may eventually take, it is clear that the security of Scandinavia as a whole is of great importance. If Norway and Denmark can be held the Baltic is sealed off, submarine and other warships have a long way to go from Archangel and Murmansk before they can seriously threaten the passage of the North Sea and the Western Approaches, and Great Britain is much more secure against air attack. Norway and Sweden have another asset; their topography is difficult for an invader to cope with and the communications leading into them from the east are very poor. On the other hand, Denmark is inevitably lost if the forces of the central area are compelled to make any withdrawal from their forward positions at the start of the campaign. Norway would then be in a very isolated position and threatened from the direction whence she was overrun in 1940.

The proximity of Denmark to the forward Western positions on the Elbe brings out one of the weaknesses of the central area. N.A.T.O. will never embark upon a preventive war and hence will not be the aggressor if war comes. This means that the opening battle would be fought in the place and at the time selected by the enemy with whom the initiative would therefore lie. An initial withdrawal by the N.A.T.O. troops in the central area is therefore almost inevitable. As already mentioned, any withdrawal whatever on the northern flank puts Denmark in very serious jeopardy; while from every point of view it would be important

to bring the withdrawal to a halt on the Rhine at latest and this only leaves a distance of 250 miles to play with. Not much in these days of rapid movement. The other chief weakness of Western Europe, including Great Britain, is that it presents a far more concentrated target to air attack than any to be found beyond the Iron Curtain. On the other hand, the enemy's communications will be very long and contain a number of vulnerable bottlenecks.

Before considering the problems of the southern area Switzerland needs to be taken into account. It seems to have become an accepted principle of war in Western Europe that the neutrality of Switzerland shall not be violated. The reasons for this are obvious. No one stands to gain by an invasion of Switzerland. Her topography imposes the most difficult of all conditions for fighting, her army is efficient and would certainly put up a very strong resistance to any invader. Therefore an aggressor who attacks Switzerland is likely to find that he has merely added an efficient fighting force to the strength of his enemies and bogged himself down in an unprofitable campaign in very difficult country. Even remembering the strange things that totalitarian dictators will sometimes do, it seems reasonable to assume that, in a third World War, Switzerland will remain neutral as in the first two.

The problem of the southern area resembles that of the northern in that it seems to be inextricably bound up with the sea. If Austria and northern Italy were overrun, the security of the central area would not necessarily be endangered provided forces were available to defend the French Alpine frontier. But if the Italian peninsula falls into the hands of the enemy, the security of the Mediterranean is seriously weakened to say the least. Surely the southern area cannot be considered merely from the point of view of the land and air defence of Austria and Italy. Turkey and Greece, though not signatories of the Atlantic Treaty, are associated with N.A.T.O. plannings in the Mediterranean and their problems need to be taken fully into account. It is also impossible to divorce the defence of Western Europe from the question of the defence of the Middle East, and the importance of the sea passage of the Mediterranean in this connection is obvious. From this thought the mind naturally turns to the question of Yugoslavia, ideologically communist but independent in outlook and determined to resist aggression from any quarter. There can of course be no question of it falling upon her from any direction but the east. Therefore she surely must be taken into account in considering the defence of the southern area. While it is highly improbable that she will ever adhere to the Atlantic Treaty, at the time of writing she is seeking assistance from the West in the matter of the supply of armaments. Should this come to pass, clearly they should only be supplied if certain conditions are fulfilled. The first condition must certainly be that she would cooperate in the fullest degree in the important point of keeping the enemy out of Greece and eliminating Albania as an isolated outpost of the eastern bloc, as she is at present. Obviously the whole position would be greatly strengthened if the enemy could be kept out of Yugoslavia, Greece and Turkey. The passage of the Mediterranean would then be almost completely secure. But from the North Cape through Norway and Denmark, thence across Western Germany to Switzerland, on again through Austria and Yugoslavia to Greece and finally to the

frontiers of Turkey is an immense length of ground to be made secure against an enemy who would be on interior lines and able to choose his point of attack. Penetration somewhere would be certain to occur.

We are told that the southern area of General Eisenhower's Command is to be commanded by an Italian general. This must clearly mean that its main purpose is the defence of the Italian peninsula. Therefore, if forced back from Italy's north-eastern frontier, the line of withdrawal will be towards the neck of the Peninsula and away from the central area. It would hardly be good for the morale of the Italian forces to expect them to abandon their native land to the enemy and turn aside to defend the Alpine frontier of France. It is difficult to avoid the conclusion that a better set up would be to have the northern and central areas under General Eisenhower and a separate Mediterranean Command, as we had in the last war. This Command to control the whole Mediterranean from the naval point of view and Italy and any possible Balkan operations from the land point of view. The air, of course, covering both under one commander. We are quite rightly advancing step by step; surely this will be the next step.

There is another most important point to be considered which we in this country find it hard to understand because we have been more fortunate in our experience of European war than have other Western European countries. We have been defeated in the past on the Continent, at Dunkirk for example, but we have never experienced the ultimate consequence of defeat; we have never suffered enemy occupation. Other countries have, some once, some twice, within living memory. Some many times in their history. The people of these countries very naturally and rightly now tend to consider the problem with their heads rather than with their hearts. They are ready to die for their country, but they do not wish to die for it in vain. They envisage the possibility of resistance, if it be not backed with sufficient strength, merely leading to total destruction of the whole scheme of things in their native land. It is therefore quite plausible for them to argue that, rather than suffer total destruction with those who survive shut up in concentration camps, it may be better to let the enemy in and await liberation from the West, as they had to do last time. They know, from their previous experience of enemy occupations, that they are past masters of the art of making the best for themselves of such a situation and at the same time making the worst of it for the occupying force. Then, when liberation comes, there may be something left in the country to carry on with. All this is perfectly logical and we should try to understand and appreciate it. None of these countries can hope to survive by their own unaided efforts. They must have help and they must see beforehand that the help is there. The lesson for N.A.T.O. from all this is simply that men, guns, tanks and aircraft must be on the spot in Western Europe in such quantities as to engender a general feeling of security as soon as possible. We still have a long way to go before this will be the case.

The above argument applies with equal force to the question of Germany. The German point of view is not of course the same as that of the countries with long memories of occupations. But it is strength more than anything else which Germans admire and respect. Their main desire no doubt is to see their country once more united. They will

think that this end is most likely to be achieved by lining up with whatever European combination most clearly demonstrates its power. The stronger the fighting forces of N.A.T.O. appear to be in Western Europe the more helpful will be the attitude of the inhabitants of the three Western Zones of Germany. There we may leave the question of German participation in Western Defence. The experiences of 1950 have clearly indicated the pitfalls which beset it. It will be time to tackle it when our strength is built up.

Such are the internal problems of N.A.T.O. Bearing them in mind, we must now try to look behind the Iron Curtain. Here also we find a group of nations combining for defence. But there is an essential difference in atmosphere compared to N.A.T.O. The eastern group is completely dominated by one overwhelming power whose commands the satellites have meekly to obey; there is no question of equal partnership and mutual discussion on the western model. Thus the eastern group enjoys the advantages of unity of direction to an extent unobtainable in the democratic atmosphere of the west. It is, however, far from being homogeneous. It comprises four different races (Slav, German, Rumanic, and Magyar) subdivided into a considerable number of groups differing widely in culture, outlook and religious creed. The respective governments may all sing the same tune, with the Kremlin wielding the conductor's baton, but will the mass of the people be at ease with one another and all willingly pulling together?

The satellites are also weak in industrial raw materials except for Polish and Czech coal, Rumanian, Hungarian, and Austrian oil, and Hungarian bauxite. They are self-sufficing only in oil, of which they have an exportable surplus. As regards heavy industry, the lynch-pin of production for war purposes, Czechoslovakia and Poland alone have any worth speaking of and both depend on imports of iron ore. This brings us to the importance of Sweden's position in the European picture, to which reference has already been made. The high grade Swedish iron ores are of vital importance to the eastern group, just as they were to Germany in the last two wars. If Sweden were to stop the export of these ores to Czechoslovakia the Czech heavy industry would be seriously crippled. Either Czechoslovakia's contribution to the resources of the Soviet Union in heavy engineering and machine tool production would cease, or she would have to be supplied with high grade Russian ores from the Krivoi Rog mines with a corresponding reduction in the output of Russian heavy industry.

The importance of her iron ore deposits to Europe in general and Eastern Europe in particular presents Sweden with a vital problem. She still dreams of maintaining in a third world war the neutrality which she has successfully maintained in two. Is she to do it by paying Danegeld in iron ore to both sides or to one side? Or if she refuses to pay Danegeld at all can she hope to avoid attack? To help her in answering these questions she knows, or should know, that, if attack comes upon her, it can only come from one direction—the east. To say the least, the path along which Sweden must travel in pursuit of neutrality appears to consist mainly of a tightrope.

From this digression into the affairs of Sweden, we must turn to consideration of the armed forces of the eight satellites. With the exception

of Czechoslovakia none of these countries can supply their own arms and equipment; all the others rely on the resources of the Soviet Union. It may be that the Kremlin aims at complete standardisation of weapons in order further to consolidate their hold on the satellites. It is doubtful whether Russian resources would at present suffice to extend such a policy to Czechoslovakia.

The armed forces of Poland, Czechoslovakia, Hungary, Roumania and Bulgaria probably add up to a total of between 1,000,000 and 1,250,000 men, very short of motor transport and A.F.Vs. and very weak in air support. All adhere to the Russian divisional organisation, which means that their divisions are about half the size of those of the Western Powers. Collectively they produce about fifty divisions, the equivalent of between twenty-five and thirty of ours. There remains the question of whether they would prove assets or liabilities to the Red Army in any general conflict. The cases of Hungary and Roumania perhaps lend themselves best to speculation on these lines. In World War I Roumania fought against Germany and in World War II beside her. In neither case did she prove to be a very satisfactory ally. Hungary fought both times for Germany, but on neither occasion with very much enthusiasm and élan. There seems little reason to suppose that her people would behave very differently fighting alongside Russians in a contest in which they stood to gain nothing. Poland and Czechoslovakia do not provide quite such clear cut examples, but there seems little reason to suppose that they would react very differently to the other three. On the whole it seems improbable that the satellites will prove to be assets to the Soviet Union in war.

In this connection it is noteworthy that, on the very day that this paragraph is written, it was announced in the Press that Russian troops were moving into Roumania and thence into Hungary and Bulgaria and that they were taking over the defence of the whole Black Sea coast up to the Turkish frontier. If this is so, it seems to point to two conclusions.

- (1) That all the forces behind the Iron Curtain are to be completely integrated under the wing of the Red Army.
- (2) That the Kremlin has no high opinion of the reliability of the satellite armies. Surely the Black Sea can hardly be regarded as one of the more vulnerable areas, yet apparently the Roumanians and Bulgarians cannot be trusted to defend their sectors of it.

With regard to the fighting forces of the Soviet Union, it is perhaps useful to reflect on the lessons of history since the fighting characteristics of nations tend to remain constant throughout the ages. We know that Russians are doughty fighters, enured to conditions of extreme hardship and knowing nothing of the elaborate arrangements for comfort and welfare which have become part and parcel of the military organisation of the West. Logistics, the key to success in modern war, present an infinitely simpler problem to them than to us, a distinct advantage. We know that in the last war they would, to say the least, have been very hard put to it indeed without the assistance of lend-lease, and that they cannot hope for anything of the same sort in a future war, in which they will certainly be compelled to rely solely on their own resources for all forms of equipment and supplies. What has been said earlier in this chapter makes it clear that the satellites can put but little into the common pot in this respect.

The question of how far they have been able to develop their resources since the war to meet this problem will be dealt with presently. One essential fact must, however, be constantly borne in mind. The fact that the Russian people are enured to a low standard of living, and have never in their lives been cosseted, means that a given amount of industrial and agricultural output will go much further with them than with us. It is therefore extremely misleading and dangerous to attempt to forecast the probable course of future war in mathematical calculations comparing, for example, the output of steel in the East and the West. In the East the needs of the civil population can, in war, be reduced almost to vanishing point without the loss of morale which would certainly be the result if such a policy was adopted in the West. Similarly, a ton of steel will certainly go further under the simple conditions of the Red Army than under the elaborate organisation required by the Western Powers.

History also tells us that the Russian people have never displayed any aptitude for maritime warfare; a point of extreme importance. The same thing applies in some measure as regards the air. In the last war the Russian Air Force was used practically entirely in tactical support of the ground forces; it gained little experience of strategic operations in the air. No doubt much effort has since been put into redressing this balance, but the lack of practical experience under war conditions will still remain.

Having considered the position of the satellites and reflected on what we can learn from history with regard to the fighting capacity of the Russian armed forces, we come to the question of how far Soviet industry can meet the requirements of a world war. In this connection it must of course be borne in mind that the industrial resources of the Soviet Union would be responsible for supplying the Chinese and whatever other Asiatic peoples might follow the communist banner, in addition to supplying their own forces and those of their European satellites.

In 1946 Stalin explained the defeat of Hitler by saying "the Party rightly decided to concentrate on heavy industry and collectivised agriculture; it knew war was coming . . . and that to be too late in this task was to lose." This is a thoroughly realistic point of view. Heavy industry produces the weapons and munitions of war and neither the workers who manufacture these nor the soldiers, sailors and airmen who exploit them can function unless they are fed. Certainly deprived in any future war of such outside help in supplies as they received in the last war, the fighting capacity of the Eastern Powers rests upon the extent to which these two vital factors can be developed. The first post-war five year plan has been completed and, from what is known about it, it seems that its major objective has been reconstruction rather than rearmament. In other words, the emphasis has been on expanding the war potential of the Union as the first essential step in preparation for war. A long term policy demanding abstinence from hot war until it is fulfilled. Therefore the complementary short term policy has been concentration on defence problems, while leaving offence to the North Koreans and the Chinese. Thus, while the United States cut their military budget by 87 per cent. between 1945 and 1948, the Soviet Union in the same period reduced their disclosed payments for arms by a mere 20 per cent.

The advance made by heavy industry during the course of the recent

five year plan seems to have been impressive, for example, the output of machine tools has been trebled and of lorries quadrupled. As regards the production of basic materials, output of pig iron, steel, coal, electricity, and oil have been about doubled. Of course, in spite of these increases, resources remain far below those of the Western Powers. But for reasons already given any direct comparison is quite misleading.

As regards agriculture it seems that the position is much less favourable. It is openly admitted that production of livestock and grain have been far below the target set in the five year plan. Therefore, even if the fighting forces and the workers in heavy industry are well fed, some part of the population must be on short commons.*

Altogether the picture of Soviet war potential, in so far as we can see it, should induce neither complacency nor despondency in Western minds. But it seems to explain a good deal that has happened in recent years.

So far no mention has been made of the atomic bomb in this article. It is now clear that the secret is known in the East as well as in the West. No one can be sure as to the relative state of development. Suffice it to say that the problems of its employment need careful thought, particularly on the part of whoever desires to acquire territory as a result of war. It is of little use to acquire what you have already destroyed.

In conclusion the whole problem may be summed up in very few words. The object of the North Atlantic Treaty is to prevent war. If it fails in this primary object, it has the secondary one of fighting a successful war. The recipe for both objects is the same—strength both physical and moral.

By the painful process of trial and error we have learnt that appeasement is vain when offered to totalitarian dictators and leaders of "people's democracies"; it is only strength that they respect and only strength that they hesitate to oppose. The importance of the outward and visible signs of physical strength in the shape of soldiers, guns and tanks on the soil of Western Europe as a stimulant to the moral strength of the inhabitants has already been stressed in this chapter. All need to put their shoulders to the wheel with the full weight of their bodies behind and let no one look at his next door neighbour and either think or say "he is not pushing as hard as I am." Let each nation aim to set the example and never pause to wonder if it is being followed. Recrimination is the worst enemy of morale.

E. H. WYNDHAM

* This sketch of Russian Industry and agriculture is based on an article in *The Economist* of April 7, 1951.

CHAPTER IV

SOVIET AND WESTERN STRATEGY

I

COMMUNIST PURPOSES and strategy and the theory upon which they rest have been plainly stated to the whole world for more than twenty years. The Bolshevik maximum programme actually goes back as far as July 1903, to the Second Congress of the Russian Social Democratic Party. As formulated by Stalin, the principal aim of this programme was "Socialist revolution, overthrow of the power of capitalists, establishment of the dictatorship of the proletariat." * Twenty years later, in his most important theoretical pronouncement on Leninism, Stalin stated the Communist purpose after the Bolshevik Revolution of October 1917 as follows: "The goal is to consolidate the dictatorship of the proletariat in one country *using it as a base for the overthrow of imperialism in all countries*. Revolution spreads beyond the confines of one country, the epoch of world revolution has begun."† The Programme of the Communist International, adopted by the Sixth World Congress of the Comintern on September 1, 1928, states: "The ultimate aim of the Communist International is to replace world capitalist economy by a world system of Communism"; and adds that "the dictatorship of the world proletariat is an essential and vital condition precedent to the transformation of world capitalist economy into Socialist economy." ‡

The first question which these statements raise is whether they mean what they say. This is considered below. Assuming that they are in fact meant, the second question is what they really signify. Here the authors themselves provide keys to understanding. Three terms in the passages quoted—imperialism, dictatorship of the proletariat, a world system of Communism—require definition. For present purposes the term "imperialism" may be briefly (and correctly) equated with the phrase "world capitalist economy" as used in the Programme of the Communist International—understanding "world capitalist economy" to signify not only economic arrangements as such but the whole prevailing order of class structure and rule which it is the Communist purpose to overthrow.

The term "dictatorship of the proletariat" is amply explained by Stalin and Lenin. Stalin quotes with approval a definition of Lenin: "The scientific concept of dictatorship means nothing more than unlimited power, absolutely unconfined by any kind of laws or regulations but

* *History of the Communist Party of the Soviet Union (Bolsheviks) (Short Course)*. Edited by a Commission of the Central Committee of the C.P.S.U.(B.). Authorised by the Central Committee of the C.P.S.U.(B.), 1938; English edition (Moscow, 1943), p. 41; Russian edition (Moscow, 1945), p. 40.

† "On the Foundations of Leninism." Lectures delivered by Stalin at Sverdlov University in April 1924. Reprinted in *Voprosy Leninizma*, by J. Stalin, 11th edition (Moscow, 1945), p. 54; English translation (*Problems of Leninism*, Moscow, 1945), p. 67. My italics.

‡ The Programme of the Communist International. Reprinted *A Handbook of Marxism*, edited by Emile Burns (London, 1935, Gollancz), pp. 984, 990.

resting directly upon force . . ."; "unlimited power, based on force and not on law." * Stalin himself says that "the dictatorship of the proletariat is the weapon of the proletarian revolution, its organ, its most important base, summoned into life in order, first, to crush the resistance of the overthrown exploiters and consolidate its own achievements, and secondly to carry out the proletarian revolution to the end, to carry out the revolution to the complete victory of socialism." † Hence, Stalin concludes,

The dictatorship of the proletariat cannot arise as the result of the peaceful development of bourgeois society and of bourgeois democracy; it can arise only as the result of the smashing of the bourgeois state machine, of the bourgeois army, of the bourgeois civil service, of the bourgeois police. . . . In other words, the law of the smashing of the bourgeois state machine as a preliminary condition for such a revolution, is the inevitable law of the revolutionary movement in the imperialist countries of the world." ‡

The same "law," it should be noted, with all its implications of violence, brutality, bloodshed, expropriation, and terror on a large scale, is explicitly applied by Stalin to Britain and the United States.§

The term "a world system of Communism" signifies three things. First, it means the arrival of Utopia. As the 1928 Programme of the Communist International puts it—

Communist society . . . will abolish all forms of exploitation and oppression of man by man. . . . For the first time in its history mankind will take its fate into its own hands. . . . Want and economic inequality, the misery of enslaved classes, and a wretched standard of life generally will disappear; the hierarchy created in the division of labour system will be abolished together with the antagonism between mental and manual labour; and the last vestige of the social inequality of the sexes will be removed. . . . Culture will become the acquirement of all. . . .

The development of the productive forces of world Communist society will make it possible to raise the well-being of the whole of humanity . . . and . . . will enable culture to flourish as never before in history. This new culture of a humanity that is united for the first time in history . . . will . . . be based upon clear and transparent human relationships. Hence, it will bury for ever all mysticism, religion, prejudice, and superstition, and will give a powerful impetus to the development of all-conquering, scientific knowledge.||

This messianic picture, this thumb-nail sketch of the arrival of heaven upon earth, is of the highest *strategic* importance, for it is precisely this myth that seduces malcontents, idealists, and the young by countless thousands, that constitutes the attractive force of Communism for the poor, ignorant, and aspiring masses of mankind, and that represents the great internal dissolving force against which Western society has to fight.

The phrase "a world of Communism" has two other meanings as well. First, to the inner core of Party members, the "steel-hardened cadres," who to-day, in so-called capitalist society, are usually persons of little or no importance, the coming of Communism and the dictatorship of the proletariat promise power, position, authority, and wealth—and promise those things with a fullness and certainty inferred from the Soviet example.

* Quoted in "On the Problems of Leninism," by J. V. Stalin, dated January 25, 1926, and reprinted in *Voprosy*, p. 116; English translation, pp. 134-35.

† "On the Foundations of Leninism," *Voprosy*, p. 26; English translation, p. 39.

‡ *Op. cit.*, *Voprosy*, pp. 31-2; English translation, pp. 44-5.

§ *Ibid.*, p. 31; English translation, p. 45.

|| *A Handbook of Marxism*, pp. 985-7.

To such people Communism means a maximum of worldly fulfilment attainable by them in no other way. This promise is the chain that binds them to the Party, the key that unlocks their utmost energies, the dynamic that gives them driving force and power. The last meaning of "a world of Communism" derives from the fact that the Communist International adopted its programme when completely under the domination of Soviet Communism, which neither then nor subsequently has shown any intention of loosening its hold over Communism in other countries. Consequently, to Russian Communists the phrase "a world of Communism" signifies a Soviet world order under Russian hegemony; and this fact promises satisfaction to the important elements of Great Russian nationalism and messianism which exist in the Soviet Union.

Before turning to Communist strategy, the Communist theory of world revolution must be considered. According to this theory, capitalism contains what are termed "contradictions," of which at the so-called "imperialist" stage three are especially important. The first is the contradiction between labour and capital in the advanced capitalist countries themselves. This ultimately brings the masses to proletarian revolution as their only salvation, intensifies the revolutionary crisis in those countries, and strengthens the explosive elements on the internal, proletarian front. The second contradiction results from the expansion of capitalism with its adjuncts of spheres of influence and colonial possessions extending over practically the entire globe. These convert separate national economies and territories into links in the single chain of a world economy and split the population of the earth into two camps—on the one side, a handful of "advanced" capitalist countries, and on the other side, the great majority of colonial and dependent countries, which are forced to fight for liberation from the imperialist yoke. The part of Eastern nationalism, it should be noted, is of the highest importance. Stalin asserts categorically that "the road to victory of the revolution in the West runs through a revolutionary alliance with the liberation movement of colonies and dependent countries against imperialism." The third contradiction is the struggle of capitalist countries among themselves. This struggle inevitably involves internecine, inter-capitalist wars, which in turn weaken the position of capitalism generally, speed up proletarian revolution, and in practice make it indispensable. From this third "contradiction" Stalin draws the conclusion that under imperialism wars are inevitable, and that coalition is unavoidable between the proletarian revolution in Europe and the colonial revolution in the East, the two forming together a single world front of revolution against the world front of imperialism.*

In considering this analysis, non-Marxist readers are sometimes baffled or confused by the repugnant and, strictly speaking, inaccurate Marxian term "contradictions." If for this word the idea of tension, resentment, and struggle is substituted, and if allowance is made for the attraction which the Communist Utopian mirage has for many different kinds of people, the analysis is easier to follow, and the considerable measure of truth it contains becomes clear.

* The substance of this paragraph comes from "On the Foundations of Leninism," *Voprosy*, pp. 3 and 17; English translation, pp. 15 and 29-30. The direct quotation from Stalin is from "Foundations," *Voprosy*, p. 47; English translation, p. 61.

Besides the "contradictions" of "imperialism" which make for revolution, active measures by the Soviet Union are essential. Stalin writes :—

To overthrow the power of the bourgeoisie and establish the power of the proletariat in one country still does not mean to guarantee the complete victory of socialism. . . . For this the victory of the revolution is indispensable in at least several countries. Hence the development and support of revolution in other countries is an essential task of the victorious revolution. Hence the revolution in the victorious country must regard itself not as a self-sufficient entity but as an aid, a means of hastening the victory of revolution in other countries.*

And Stalin adds elsewhere that "the world significance of the October Revolution lies in the fact that it constitutes the first stage of world revolution and a mighty base for its further development." †

Stalin expressly rules out the possibility of effortless and automatic revolution. This idea, he said in 1934, "is a profound mistake. The revolution never comes by itself. It must be prepared for and won." ‡ Soviet help in bringing about world revolution not merely does not exclude war but actively envisages it. Revolution, Stalin told H. G. Wells, in 1934, "is not a merely spontaneous process. . . . No—revolution . . . has always been a struggle, an excruciating and cruel struggle, a struggle for life and death." § A few lines before the pronouncement on the world significance of the October Revolution quoted in the preceding paragraph, Stalin buttresses with the authority of Lenin his own view as to how the Soviet Union, "the first Socialist country," should most effectively aid the workers "of all other countries." This aid, Stalin says, quoting Lenin, should be given, first, through a maximum effort by the Soviet Union ("the victorious country") to "develop, support, rouse revolution *in all countries*" (the italics are Stalin's); and secondly (here Stalin quotes Lenin again) in that the "victorious [Soviet] proletariat," after organising its own Socialist production,

should stand up . . . *against* the remaining, capitalist world, attracting to itself the oppressed classes of other countries, raising revolt in those countries against the capitalists, in case of need coming out even with armed force against the exploiting classes and their governments.||

Finally, as though to establish beyond doubt the inevitability of war to a finish between the Communist and capitalist worlds, Stalin quotes Lenin once more :

We live . . . not only in a state, but in a system of states, and the existence of the Soviet Republic side by side with the imperialist states for a long time is unthinkable. In the end either one or the other will conquer. And until that end comes, a series of the most terrible collisions between the Soviet Republic and the bourgeois states is inevitable.

* "Foundations," *Voprosy*, pp. 25–6; English translation, p. 38.

† "The October Revolution and the Tactics of Russian Communists," dated December 17, 1924, and reprinted in *Voprosy*, p. 105; English translation, p. 123.

‡ "Report on the Work of the Central Committee to the Seventeenth Congress of the C.P.S.U.(B.)," reprinted in *Voprosy*, p. 433; English translation, p. 465.

§ "Beseda s. Stalina s angliiskim pisatelem G. D. Uellsom," *Bolshevik*, September 15, 1934; quoted in "Stalin on Revolution," by "Historicus," *Foreign Affairs*, vol. 27, No. 2 (New York, January 1949), p. 196.

|| "The October Revolution and the Tactics of Russian Communists," *Voprosy*, p. 104; English translation, p. 122.

On this forecast of inevitable wars Stalin comments: "Clear, one would think." *

Communist strategy may now be considered. Stalin gives a plain, if naturally only a general, indication of his strategic and tactical principles. As regards strategy, the main task is "concentration of the main forces of the revolution at the enemy's most vulnerable point at the decisive moment"; or, from a tactical standpoint, "the discerning at any given moment of the particular link in the chain of processes, by grasping which it becomes possible to hold the whole chain and prepare the conditions for achieving strategic success." More generally, "the task of tactical leadership consists in mastering all forms of the struggle and the organisation of the proletarian and securing their correct use in order, in a given relationship of forces, to achieve the maximum results required to prepare for strategic success." † Or, as Stalin wrote in a paper on the political strategy and tactics of Russian Communists—a paper which, though composed in 1921, was not published until 1947, when he considered it worth including in his collected works:

Tactics, guiding itself by the directives of strategy and by experience of the revolutionary movement . . . calculating at every given moment the state of forces inside the proletariat and its allies (greater or less cultivation, greater or less degree of organisation and class-consciousness, presence of particular traditions, presence of particular forms of movement, forms of organisation, *basic* and *secondary*), as well as in the camp of the adversary, profiting by discord and every kind of confusion in the camp of the adversary—marks out those *concrete courses* for winning the wide masses to the proletarian side and leading them to battle stations on the social front . . . which most surely pave the way for strategic successes.‡

It would take very little change indeed to adapt the principles stated in this passage to the tactical use of physical force by Stalin and the other men of the Kremlin.

Communist purposes, the Communist theory of proletarian revolution, and the principles of Communist strategy and tactics may now be summarised. The Communist purpose and objective is world revolution. The instrument of revolution is the dictatorship of the proletariat, which is based on force, is unrestricted by law, and achieves its ends by violence and if necessary by bloodshed. These methods are to be expressly applied to Britain and the United States. The underlying forces creating a revolutionary situation in capitalist society in the age of "imperialism"

* "On the Problems of Leninism," *Voprosy*, p. 140; English translation, p. 160. It is significant that in a letter to Maxim Gorky Stalin wrote: "We are in fact not against *all* war. We are *against* imperialist war, which is counter-revolutionary war. But we are *for* liberating, anti-imperialist, revolutionary war, regardless of the fact that this kind of war, as is well known, is not only not free from the 'horrors of bloodshed', but actually teems with them." In other words, Stalin is against any war ("imperialist, . . . counter-revolutionary") which might threaten the Soviet Union (which at the time was very weak), but for any war which, because it was "liberating, anti-imperialist, revolutionary," would extend Communism and Soviet power. This letter to Gorky is dated January 17, 1930, but was first published in 1949 by the Marx-Engels-Lenin Institute in Moscow in the Russian edition of Stalin's collected writings. For the passage quoted, see J. V. Stalin, *Sochineniya* (Moscow, 1949, Gosudarstvennoe Izdatelstvo Politicheskoi Literatury), Vol. 12, p. 176. The italics are in the original. I am indebted for knowledge of this letter to Mr. D. M. Graham, of the European Service of the B.B.C.

† "On the Foundations of Leninism," *Voprosy*, pp. 57, 61, 59; English translation, pp. 72, 77, 75.

‡ "O politicheskoi strategii i taktike russkikh kommunistov," first published in Stalin's *Sochineniya*, Vol. V, p. 63; quoted in "Stalin on Revolution," p. 205.

comprise the tensions and resentment of the labouring masses against their bourgeois or capitalist masters in advanced capitalist countries, and the national or liberation movement (or nationalism, if this word be preferred) of the Eastern, colonial, and dependent peoples produced by the tensions and resentment to which foreign, European rule or control give rise. These tensions and resentments are heightened by "imperialist" wars between advanced capitalist countries; and such wars weaken the whole world front of capitalism generally. The same tensions and resentments alienate the masses from capitalist rule, while the Utopian picture of a Communist society draws them to Communism. World revolution will not be achieved, however, by the mere fact that such tensions, resentment, and attraction exist. World revolution must be prepared and made; and to make it is a major task falling on the Soviet Union. In seeking world revolution the Soviet Union will not confine itself to propaganda, agitation, and intrigue, but will also resort to armed force if and when necessary. Not one but a whole series of wars with capitalist states must be envisaged before world revolution is achieved or finally fails (the latter possibility is not really considered seriously by Lenin or Stalin). The strategy of world revolution consists in finding the weakest link in the capitalist chain for the time being and concentrating decisive force against it at the decisive moment. Communist tactics require the use, after careful calculation of all ascertainable factors in any given situation, of whatever means will clear the way to strategic success.

This picture of Communist purposes and strategy and of the theory underlying them differs widely from the picture accepted in influential circles in the West ; * and the question at once arises whether Stalin means what he says and whether the picture drawn here is correct. Soviet conduct will answer the major question sooner or later ; as regards the importance which Stalin attaches to theory, the documents even now make informed doubt impossible. More than twenty-five years ago, in his lectures "On the Foundations of Leninism," Stalin wrote :

The tendency of practical workers to brush theory aside contradicts the whole spirit of Leninism and is pregnant with great dangers to the cause.

Theory is the experience of the working-class movement in all countries taken in its general aspect. Theory of course becomes futile if it is not linked with revolutionary practice, just as practice becomes blind if it does not light its path with revolutionary theory. But theory can be transformed into the greatest strength of the working-class movement if it is built up in indissoluble connection with revolutionary practice ; because it, and it alone, can give the movement confidence, the power of orientation, and understanding of the inner connection between surrounding events ; because it, and it alone, can help practice to understand not only how and where classes are moving in the present, but also how and where they must move in the near future.†

Two years later, in his pamphlet "On the Problems of Leninism," Stalin wrote a sentence which makes clear one main reason for the importance he gives to theory. "The dictatorship of the proletariat," he observed, "consists of the directives of the Party, plus their execution by the mass

* For example, in the report on *Defence in the Cold War*, prepared by a strong Chatham House Study Group (London and New York, 1950, Royal Institute of International Affairs), and in Mr. Edward Crankshaw's interesting study *Russia by Daylight* (London, 1951, Michael Joseph).

† *Voprosy*, pp. 13-14 ; English translation, p. 26.

organisations of the proletariat, plus their transformation into life by the population." * In the *History of the Communist Party of the Soviet Union (Short Course)* Stalin returned with even greater emphasis to the same theme. In summing up the lessons of the Party's history Stalin wrote:

The history of our Party further teaches that a party of the working class cannot fulfil the role of leader of its class, cannot fulfil the role of organiser and leader of the proletarian revolution unless . . . it has mastered Marxist-Leninist theory.

The strength of Marxist-Leninist theory lies in the fact that it gives the Party the possibility of orienting itself to the situation, of understanding the inner connection of surrounding events, of foreseeing the course of events, and of discerning not only how and where events are developing in the present, but also how and where they must develop in the future.

Only a party which has mastered Marxist-Leninist theory can advance confidently and lead the working class forward. . . .

Mastery of Marxist-Leninist theory by no means signifies learning all its formulas and conclusions and clinging to their every letter. . . .

Mastery of Marxist-Leninist theory means assimilating the *essence* of this theory and learning to use this theory for solving the practical problems of the revolutionary movement in the various circumstances of the class struggle of the proletariat. . . .

Marxist-Leninist theory is not dogma but a guide to action. . . .

The Bolshevik Party could not have conquered in October 1917 if its advanced cadres had not mastered the theory of Marxism, if they had not learnt to regard this theory as a guide to action. . . .†

These statements and claims are remarkable. If they merely fell from the pen of an armchair theorist they might be disregarded. But Stalin is a great man of action. *Problems of Leninism* (the book, not the essay with a similar title), the principal collection of his writings for popular use, has gone through eleven editions to date. Up to the end of 1948 more than 16 million copies had been published in fifty-one languages, including 5 million copies of the eleventh edition in forty-five languages. The publishers' foreword to this edition states explicitly that changes from the previous edition were made with the author's consent. Stalin's *History of the Communist Party of the Soviet Union (Short Course)* was first published in 1938 and is still being reprinted; between 1938 and 1948 more than 34 million copies were published in sixty-four languages. The fundamental role of these two volumes in the indoctrination of party workers and in compulsory courses in Marxism-Leninism gives them high value as evidence of current Communist orthodoxy according to Stalin. And it is precisely in these works that Stalin states with the utmost emphasis the outstanding importance that he attaches to theory.

From all this one conclusion is surely unchallengeable. The statesmen and peoples of the West will neglect this theory at their peril. Neglect would be the more inexcusable because of the dire consequences of neglect of *Mein Kampf* between the wars. What powerful men of action and leaders of immense armed forces write about their purposes and strategy—what they must write in order that their followers may have essential

* *Voprosy*, p. 123; English translation, p. 142. It should be noted that, in so far as the "mass organisations of the proletariat" which execute Party directives and the "population" which transforms them into life are Great Russians, the broad and powerful streams of Russian nationalism and messianism can come into play to reinforce motives drawn directly from the desire for Communist world domination.

† *Istoriya Vsesoyuznoi Kommunisticheskoi Partii (Bolshevikov) (Kratkii Kurs)* (Moscow, 1945), pp. 339-42; English translation (Moscow, 1943), pp. 355-8.

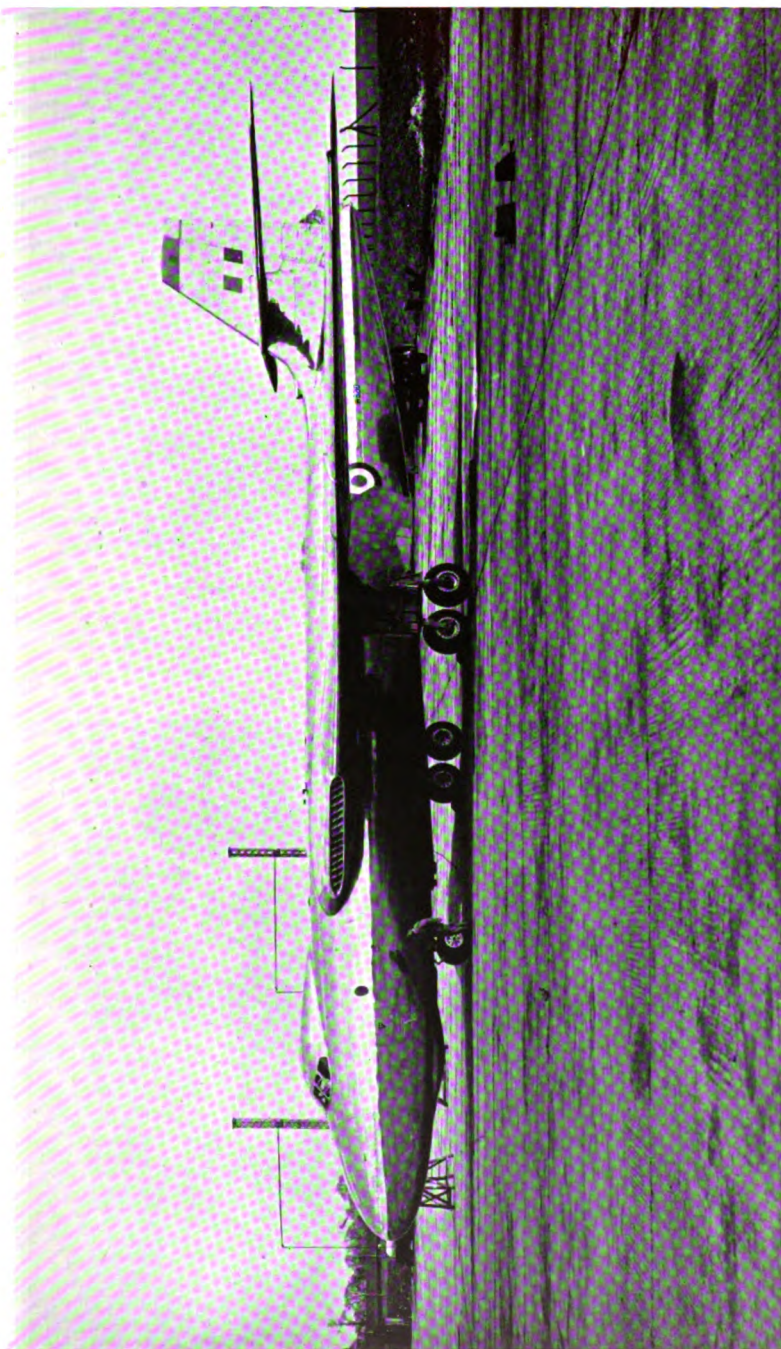
guidance—cannot be without importance to the peoples whom they threaten with destruction.

II

Strategy is essentially a relationship between purposes and means. The Soviet purpose is the establishment of world Communism under Russian hegemony and close Moscow control. Like any other politically expanding force, Communism must think in terms of the realities of power—geography, population, economic resources, and industrial and military strength. This means that the Communist advance towards world revolution and Soviet progress towards a world increasingly under Communist domination centred on Moscow must be achieved by bringing more and more countries under Communist control, reducing correspondingly the area left to the free world, and sapping the foundations of its strength. Since physical geography remains constant, since economic and industrial geography alter slowly, and since strategic geography is affected only by technological developments (especially in transport), and by the gradual processes of economic and industrial change, it follows that much of the expansion of Soviet territories occupying in the main the former area of Tsarist Russia will include among its early goals many of the objectives of Russian imperialism during the last century or two of Romanov rule. This territorial correspondence will incidentally evoke among nationally conscious Russians sympathetic responses deeply rooted in history. It will also blend the Great Russian messianism expressed in the phrase "Moscow the Third Rome" * with the materialist messianism of Communism, each drawing strength from suitable identification with the other. The free world and the non-Russian world would, however, fall into grievous error if they merely equated these disparate and ultimately very different forces, which indeed acquire their most dangerous strength from their unique, and uniquely explosive, mixture.

What is the world picture of forces and countries which must be overrun or absorbed if world revolution is to triumph? The answer must be sought not with the eyes of London or Washington but from the unfamiliar vantage-point of Moscow. Towards the end of World War II, before China fell to the Communists and before British rule ended in India, there were eight major centres of population, production and material resources still outside Communist hands. These were China and Japan in East Asia; the Indian sub-continent in South Asia; the Middle East; the Central European industrial complex comprising German and Polish Silesia and Czechoslovakia; the West European industrial complex stretching from the Ruhr to the Pas-de-Calais and from Liège to Lorraine;

* This idea goes back to the end of the fifteenth century after the capture of Constantinople, till then the leading centre of Eastern or Orthodox Christianity. The theory is fully developed in the letters of Philotheus, abbot of a Pskov monastery, to Ivan the Great. "The church of ancient Rome fell because of the Apollinarian heresy," wrote Philotheus; "as to the second Rome—the church of Constantinople—it has been hewn by the axes of Ishmaelites; but this third new Rome—the Holy Apostolic church, under thy mighty rule, shines throughout the entire world more brightly than the sun. All the Orthodox Christian realms have converged in thine own. Thou art the sole Autocrat of the universe, the only Tsar of the Christians. . . . Observe and hearken, O pious Tsar," Philotheus continued, "two Romes have fallen, but the third stands, and no fourth can ever be." (Paul Miliukov, *Outlines of Russian Culture* (Philadelphia, 1948, University of Pennsylvania Press; London: Geoffrey Cumberlege), pp. 15–16.)



Vickers 660 4-engine Jet Bomber



Fairey Delta (FD1) Research Aircraft
Crown copyright reserved



Bell XI Experimental Rocket Plane for supersonic research

Britain; and the United States. Other areas secondary only to these in strategic importance and as great sources of raw materials were Formosa, South-east Asia and Indonesia (including Singapore and its approaches), Greece and Turkey, Italy and Spain (particularly as keys to the central and western Mediterranean), Scandinavia, Alaska, parts of Africa, and parts of Latin America.

After World War II the first major advances brought areas contiguous to Soviet territory under Communist control. The advance of Poland to the Oder-Neisse frontier, the establishment of a Communist regime in Eastern Germany, and the February 1948 *coup* in Czechoslovakia yielded Moscow the East European industrial complex. A year after the Prague *coup* Mao Tse-tung's unexpectedly early and complete victory over the Kuomintang installed a Communist regime in China. Smaller Soviet gains—they include the acquisition of Bessarabia, the Bukovina, and Ruthenia, the absorption of Tannu-Tuva, the reported establishment of Soviet control over western Sinkiang and northern Manchuria, and the annexation of southern Sakhalin and the Kuriles—had meanwhile expanded Soviet territory or control beyond the farthest limits ruled by the Tsars.* Of the remaining world centres of population, industry, and resources, Japan, the whole Indian sub-continent, and the Middle East form part of the great power vacuum which (except for Korea and, to a much smaller extent, Indo-China) stretches across non-Communist Asia from Cairo to Tokyo; and only the West European complex, Britain, and the United States are still both industrial and power centres (actual or potential) and also wholly outside Communist control.

In what order of priority does Communist world strategy place these remaining major centres—and also the secondary areas listed above? Outside the narrowest circles of the Kremlin no certain answer can of course be given. Nevertheless, the problem is not indeterminate; and the non-Communist world can at least find guidance from certain plain and entirely objective probabilities.

The main objective of world Communism must be the United States, for until that country is fatally weakened or overrun its gigantic human, industrial, spiritual, and, ultimately, military power must remain as a potential mortal threat to Soviet and Communist ambitions. But since successful attack requires preliminary weakening of the United States,

* On May 27, 1951 (see *The Times*, May 28, 1951), Peking announced an agreement with Tibet which was signed on May 23 and begins the process of bringing that country under Chinese Communist control. Under the agreement Communist China has secured control of Tibet's foreign affairs and armed forces, installed her own trained nominee—the Panchen Lama, whom some regard as even holier than the Dalai Lama—as at least the second most important Tibetan authority, and obtained the right to establish a military government commission and army headquarters in the country. Russian air bases can now be quietly developed in Tibet; Communist influence and agitation will certainly be felt increasingly in Nepal, Sikkim, and Bhutan, and will more easily penetrate into Kashmir and India. The absorption of Tibet may appear on the surface as a long-desired Chinese success; but present relations between Peking and Moscow give it significance from a Russian standpoint also. In this connection it is interesting to note a comment by General Alexei Nikolayevich Kuropatkin, then War Minister of Tsar Nicholas II. "Our sovereign has grandiose plans in his head," Kuropatkin wrote in 1903. "He wants to seize Manchuria and proceed toward the annexation of Korea; he also plans to take Tibet under his rule. He wants to take Persia and to seize not only the Bosphorus but also the Dardanelles." (Kuropatkin, "Memoirs," *Krasnyi Arkhiv*, II and V. Quoted in David J. Dallin, *The Rise of Russia in Asia* (New Haven, 1949, Yale University Press, p. 42).

as well as air and above all sea power which Moscow lacks, a second and nearer major objective must be the acquisition of productive resources (particularly coal, steel, armament industries, and shipbuilding) and trained industrial manpower sufficient to put Soviet-controlled economic power on an even footing with American economic power—or displace the world economic balance in Soviet favour. A third major objective must be to block Western access to materials essential for the actual conduct of war. A fourth major objective must be to deprive the West—and particularly the United States—of other key raw materials, above all uranium and other ores required for atomic energy. As between these several objectives, considerations of strategic geography will also affect the Soviet choice.

This analysis makes possible a preliminary allotment of probable strategic priorities to the six major world centres still outside Soviet control. The United States must come last on the list because it cannot at present be successfully attacked with a view to direct conquest. The Indian sub-continent should also have a low listing because its productive resources and industrially trained manpower are of secondary importance, as also are most of its raw materials; because in terms of strategic geography it is remote, leads nowhere to the west or south, and is not essential to Soviet moves in other directions. In addition, the Kashmir dispute has so largely paralysed the small and relatively weak armed forces of India and Pakistan that both countries can be gathered like ripe fruit if and when the time should ever come. Japan is also industrially of secondary importance; * while strategically, though its defensive value to the West is enormous both for containing Communist power in East Asia and for safeguarding the northern approaches to the vast natural wealth of South-east Asia and the South Seas, it is too far from the United States to provide a satisfactory offensive base for direct attack.† On the other hand, Britain and the West European complex together constitute the world's largest concentration of heavy industry, engineering, and shipbuilding capacity and of trained industrial manpower outside the United States. In addition, the strategic interrelations of Britain and the West European complex, and of both to the Central European industrial complex and to Russia itself, are obvious and of the highest importance. Similarly, Middle Eastern oil is all but vital for the war-making powers of the West; while the Suez Canal area, besides being a major key to the Eastern Mediterranean and the rest of the Middle East,

* In 1941 or 1942 Japan Proper is estimated to have had a pig-iron output of about 6 to 7 million tons, and a steel output of about the same size. If Japanese-owned plants in Manchuria are included, the output of pig-iron in these years may have been close to 10 million tons, and that of steel over 8 million tons. The Japanese production of pig-iron, was, however, based overwhelmingly upon imported ores (mainly from Manchuria and Korea), while the steel industry consumed large supplies of imported scrap. (G. T. Trewartha, *Japan: A Physical, Cultural, and Regional Geography* (University of Wisconsin Press, 1945), pp. 293–5.) Since 1945 Japan's capacity in the heavy industries, engineering, and shipbuilding has, of course, been much reduced, and in 1950 its pig-iron output was only 2.27 million long tons and its steel output only 4.38 million long tons. By comparison, the output (in million long tons) of the main Western producers in 1950 was: United States: pig-iron 58.5, steel 86.3; United Kingdom: pig-iron 9.6, steel 16.3; France: pig-iron 7.6, steel 8.5; Western Germany: pig-iron 9.3, steel 11.9. No Soviet tonnage figures for 1950 have been published; Soviet steel production in 1951 has been estimated at 27.6 million tons (see below, p 82).

† The Great Circle distance from Tokyo to San Francisco is more than 5,300 statute miles.

is also the gateway to much of Africa for a power approaching from the north-east.

To achieve its major objectives Soviet Communism commands ten groups of instruments of conquest. These are: (1) the atomic bomb; (2) conventional armaments, comprising huge Soviet and satellite armies (perhaps including substantial air-borne forces), a very large and well equipped Soviet air force, and a large submarine fleet, but no important tonnage of surface vessels; (3) the "contradictions" in advanced "capitalist" countries between labour and capital, as well as deep political differences from other causes; (4) open and concealed Communist "fifth columns" and bodies of Communist sympathisers or organisations under Communist control—including groups prepared for organised sabotage, spy net-works, and forces (in Eastern Germany the armed and trained *Bereitschaften*) capable of launching what would nominally be civil wars; (5) the "contradictions" of Eastern, colonial, and dependent countries, including Eastern and other nationalist and independent movement of various kinds; (6) organised Communist groups in some Eastern countries (like the Tudeh in Persia); (7) potential divisions between the threatened Western powers; (8) the attractive force of the Communist Utopian mirage; (9) world-wide fear and hatred of war—and especially of atomic war—particularly in Western Europe and the United States, with much consequent unwillingness to face the threat of war and a varying inclination towards appeasement; and (10) propaganda.

These various instruments of conquest fall obviously into two main classes—the military, and the political. Can the political instruments alone achieve Soviet objectives; and if not, how will the need to resort to war affect Soviet strategic priorities? How the Kremlin may appraise the situation is unknown; but to observers and students in the West the answer in the spring of 1951 appears fairly clear. As regards Britain, Western Europe, and Japan political weapons by themselves will no longer suffice. This is certainly true of Britain. It appears true of Western Europe despite still dangerous weakness, and will be increasingly true as that weakness is replaced by already growing political health and armed strength. It is also certainly true of Japan, whose people hate and fear both Russia and Communism. Only in the Middle East among major world centres are Soviet political weapons still powerful and threatening;* and even here it is not yet certain that the West will be finally deprived of Middle Eastern oil—whatever novel terms and arrangements may be required to obtain it—unless Soviet armed strength (whether open or disguised) also comes into action.

Assuming that Moscow must resort to war in order to achieve its next major objectives—this assumption is examined below—what considerations will probably influence Soviet major strategy? (1) The Kremlin

* In mid-July Mr. L. M. Vasiliev, a former Soviet official in Teheran, disclosed that Moscow's instruments of political warfare in the Middle East, in addition to the Soviet-financed and controlled Persian Tudeh (or Communist) Party, include in Persia infiltration of Soviet agents into the Majlis and other organs of the Persian Government, and also, from about 1949 onwards, bribes to prominent Persian Nationalists. The Soviet embassy in Teheran, the agency disbursing these funds, is also the focus for Soviet underground activity in Iraq and Pakistan. The Soviet purpose, according to Mr. Vasiliev, is to promote internal "revolutions" and the establishment of Communist-controlled "revolutionary" regimes, which could then "invite" Soviet troops into all three countries. See the *Daily Telegraph* (London), July 19, 1951.

will make at least two bites at the cherry of world domination; in other words, they will try to swallow their enemies one by one (Stalin's quotation of Lenin, "a series of the most terrible collisions between the Soviet Republic and the bourgeois states is inevitable," and Stalin's own comment, "Clear, one would think," are obviously relevant). (2) The Soviet leaders, like all men bent on conquest, will want the shortest possible period of actual hostilities, after which they will hope to consolidate their gains and prepare for the next step. (3) They will try to reduce damage to themselves to a minimum. (4) They will want to paralyse or disorder by direct attack their two most powerful and dangerous enemies, the United States and Great Britain. (5) They will want to bar American and British forces and supplies from the main fighting theatres by cutting the sea routes. (6) They will want to isolate Britain and, if need be, starve her out. (7) They will husband Soviet manpower and use satellite manpower to the fullest. (8) They will want to throw as much as possible of the burden of fighting and casualties on to British and American effectives. (9) They will try by a strategy of multiple fronts to dissipate American and British strength and overwhelm it in the decisive theatre. (10) Besides military means, they will continue to use political instruments of conquest—internal disorders, sabotage, spying, subversion, propaganda—as may be most effective.

In planning actual operations many other factors besides those examined here must be considered, and any attempt to forecast Soviet plans in detail must therefore be highly speculative. A few developments which at least seem probable may nevertheless be tentatively suggested.

The Kremlin will certainly attempt at an early stage to seize or paralyse bases from which atomic attacks can be launched on Soviet territory.*

* Particulars of British air bases in the Mediterranean and Middle East and of certain existing or planned American bases so far as known up to July 20, 1951, are of interest.

The principal British bases in May 1951 were: *Malta*: Luqa. *Cyprus*: Nicosia. *Libya*: Tripoli, Benghazi. *Egypt (the Canal Zone)*: Ismailia (H.Q., Middle East Air Force stationed in the Canal Zone), Deversoir (fighter base), Fayid (H.Q., No. 205 Group, M.E.A.F., which controls all operations in the Canal Zone itself), Abyad (maintenance and repair base), Kaffareet (maintenance base), Kabrit (transport unit), Shallufa (bomber base). *Iraq*: Habbaniyah.

American bases were as follows: *Greenland*: A Danish-American agreement for the common defence of Greenland was signed on April 27, 1951 (*The Times* (London), February 28, 1951, from Copenhagen). *Iceland*: The preparation of Keflavik airport, about thirty miles from Reykjavik, as an American base was reported to have begun (*Daily Telegraph*, May 12, 1951; I. M. Ball, Special Correspondent in Reykjavik). *Britain*: Operational bases: Manston, Sculthorpe, Lakenheath, Mildenhall, Brize Norton, Whyton, Basingbourne, Fairford, Upper Heyford (from map in *The Christian Science Monitor* of February 14, 1951, based on a United Press survey, and checked against official sources). *Germany*: Berlin-Tempelhof, Wiesbaden, Rhine-Main (Frankfurt a/M), Fürstenfeldbrück, Erding, Neubiberg, Landsberg (the last three are all in the Munich area) (source: as for Britain, except for Neubiberg and Landsberg, which are listed on a release of the United States Information Service in London dated June 6, 1951). *Austria*: Tulln Field (*Christian Science Monitor* map of February 14, 1951). *Morocco*: On July 12 the U.S. Air Force announced an agreement with French Morocco for the development of five permanent air bases in addition to a permanent headquarters at Rabat for the Fifth Air Division of the Strategic Air Command. Bases were listed as "under development" at Sidi Slimane, Nouasseur, and Mechra bel Ksiri; planning for two other bases was under way (*New York Times*, International Edition, July 13, 1951). *Malta*: details not stated. *Cyprus*: (? Nicosia). *Libya*: Tripoli (operational), Benghazi (being negotiated). *Egypt* (being negotiated): Deversoir, Shallufa, Fayid, Kabrit, Ismailia. *Transjordan*: Amman (being negotiated). *Iraq*: Habbaniyah (being negotiated). (Source for Malta, Cyprus, Libya, Egypt, Transjordan, and Iraq: *Christian Science Monitor* map of February 14, 1951.) *Saudi Arabia*: Dhahran, where an agreement was reported on February 21, 1951, continuing an earlier agreement for six months and giving the United

Soviet airborne forces might be used for this purpose, especially in parts of the Middle East where local defences may be weak. Atom bomb attacks on Britain and the United States must be expected, as well as organised sabotage and other kinds of disorder and subversion. The use of airborne forces, perhaps for large-scale suicide sabotage attacks on gas and electricity stations and other key public utilities, is possible, particularly in the case of Britain. The Communist arms stores reported from France and Italy since 1945 suggest that organised risings are likely to be attempted. The Soviet submarine force, which is far larger than German U-boat strength at the outset of World War II, must be expected to launch a major campaign against British and American military movement at sea, and also against British imports.*

The probable direction of Soviet ground operations is not easy to forecast. Western Europe will obviously be the main theatre of major hostilities in the West. Presumably the East German *Bereitschaften* are among the Soviet-controlled forces prepared for this contingency, though their use might be more effective in an action staged (after the example of the early fighting in Korea) to look like a German civil war. About Scandinavia little can usefully be said. The Russians will scarcely manage

States the right to land military aircraft and maintain small ground crews. No United States bomber squadrons were established at Dhahran in February 1951 (*New York Times*, February 22, 1951, giving a United Press message from Washington dated February 21, 1951). An agreement between the United States and Saudi Arabia signed on June 18, 1951, extended American rights to use Dhahran for five years. In reporting this, the *New York Times* (International Edition, July 14, 1951) stated that the Dhahran field, which commands the whole Middle East, has been reconstructed in recent years and is capable of handling the U.S. Air Force's largest strategic bombers. *Okinowa. Japan:* Besides other bases, the establishment by the United States Sea Transportation Service of two new bases at Otaru and Muroran on the northernmost main island of Hokkaido was reported in May 1951 (*Scotsman*, May 7, 1951, giving a Reuter despatch from Tokyo dated May 6, 1951).

* The *New York Herald-Tribune* on January 14, 1951, reported Rear-Admiral Charles B. Momsen, Assistant Chief of Naval Operations for Undersea Warfare, United States Navy, as of the opinion that Soviet submarine strength might amount to between 200 and 300 vessels, of which about 100 were small training types. A good many of the others are Schnörkel-equipped modern types of improved German design. A very large building programme is also in progress, though Rear-Admiral Momsen did not consider that this could be completed as early as 1952 or 1953. Mr. James Callaghan, M.P., Parliamentary and Financial Secretary to the Admiralty, pointed out in the House of Commons on March 12, 1951, that Soviet submarine strength is divided between the Baltic, the North Sea, the Black Sea, and the Pacific, and that these forces "are not easily able to reinforce each other, and they are not easily transferable from one sea to another" (House of Commons, *Official Debates*, March 12, 1951, col. 1003). At the outbreak of war in 1939 the Germans had 57 operational U-boats of modern design, the crews of which formed a *corps d'élite* of the German Navy. The first U-boats laid down at the outbreak of war were ready for service in 1941. They were of two standard types, 500-ton vessels with a total range of 11,000 miles at an economic speed, and 740-ton vessels with a 15,000-mile range. In 1942 Germany completed 304 U-boats, and at the end of 1942 417 German U-boats and 68 Italian submarines were in service. (*The Battle of the Atlantic: The Official Account of the Fight Against the U-boats*, 1939-1945, prepared for the Admiralty and the Air Ministry by the Central Office of Information (London, 1946, His Majesty's Stationery Office), pp. 7, 25.) In 1942 the daily average of U-boats at sea in the Atlantic increased from 47.7 in March to 105.4 in October; sinkings were high but irregular, ranging from 65 ships of 388,182 gross tons in March to 106 ships of 636,907 gross tons in November. Sinkings fell to less than half the November figure in December 1942 and the first five months of 1943 (except for March, a bad month), even though by May 1943 the daily average of U-boats at sea in the Atlantic had risen to 118. (S. E. Morison, *History of United States Naval Operations in World War II: Vol. I, The Battle of the Atlantic, September 1939-May 1943* (London, 1948, Oxford University Press (Geoffrey Cumberlege), p. 410.) These figures suggest that, if the Russian crews have anything like good training, the Soviet submarine fleet will take a good deal of effort to overcome.

another *coup* like Hitler's against Norway in April 1940. On the other hand Swedish iron ore is of the highest importance to the Ruhr, and Norwegian ports would be valuable as submarine bases and in Soviet hands would greatly increase the strain on British and American sea power. On balance, however, an attack on Scandinavia would be an eccentric operation, would encounter many transport difficulties, and seems *prima facie* unlikely as an early move. Yugoslavia and Greece are more probable objectives. Satellite forces (with some Russian stiffening) could be used against both; the Kremlin has the strongest motives for vengeance against Tito; and the threat to Italy of a Soviet-occupied Yugoslavia would require the diversion of British and American resources needed elsewhere. Against Greece the motive of vengeance, though present, is much weaker; but a Soviet-occupied Greece (and Crete) would threaten or make impossible Allied use of the Eastern Mediterranean, cut off Cyprus with its air base dangerously near the cities of the southern Ukraine and the oil-fields of the Caucasus, and practically isolate Turkey. Turkey itself seems too tough a nut to be directly attacked early on. The strategically critical areas are the Middle East (apart from Turkey) and Japan. To the Western powers the Middle East is all but vital both strategically and for its oil.* It is also a power vacuum. Communications, however, are bad, and large-scale military operations would present formidable problems even for Soviet forces based on the Caucasus. For the Western powers the logistical problems would be far more serious than in Korea. From both the English Channel and New York is substantially farther than from California to Korea; while if the Mediterranean and the Suez Canal were unusable and it became necessary to reach the Middle East around Africa or across the Pacific, the distance involved would be between two and two-and-a-half times the trans-Pacific route to Korea.† When the formidable burden of maintaining and supplying the forces in Korea is considered (and they are small by comparison with the forces deployed against Japan in World War II), the prodigious task of fighting half-way round the world in the Middle East becomes clear. As regards Japan, while Western naval and air command of the local waters is retained no large-scale Soviet amphibious landing on Honshu or Kyushu seems possible, or could be maintained if made. A Soviet threat to the northern island of Hokkaido does exist, however‡; and in considering Soviet

* In 1950, out of a total Middle Eastern production of some 88 million metric tons of petroleum, Persia produced 31·8 million, Saudi Arabia 27 million, Kuwait 17·2 million, Iraq 6·2 million, Egypt 2·3 million, Qatar 1·6 million, and Bahrein 1·5 million. Refinery capacities in mid-1951 in million tons were: *Persian Gulf refineries*: Abadan 25, Ras Tanurah 7, Bahrein 7, and Kuwait 1; *Mediterranean refineries*: Haifa 4, Tripoli ½. As these figures show, it is the oil of the Middle East as a whole, and not Persian oil alone, that is essential to the West. Loss of the refinery capacity at Abadan, however, though to some extent offsetable, would be more serious than the loss of Persian crude oil only.

† The actual distances are of interest. Fao (near Abadan, at the head of the Persian Gulf) has been taken as a terminus. The figures represent nautical miles. (1) *Via the Mediterranean*. English Channel-Fao, 6,198; New York-Fao, 8,418. (2) *Via Cape Town or the Pacific*. English Channel-Cape Town-Fao, 10,945; New York-Cape Town-Fao, 11,948; San Francisco-Honolulu-Fao, 12,085; New York-Panama-Honolulu-Fao, 16,695. By contrast, San Francisco-Yokohama-Pusan is 5,195 miles; while from New York to the English Channel is only some 3,000 miles.

‡ On March 1, 1951, Mr. John Foster Dulles, President Truman's Special Representative, disclosed that the Russians had seized the Habomai Islands. These islands are only about a mile from Habomai, a village on the southern coast of the Nemuro

operations in the Far East, the probable existence of a railway paralleling the Trans-Siberian to the north must be borne in mind,* as well as the not inconsiderable local Soviet iron and steel and engineering (and probably some armaments) industries. Indeed, the Soviet threat to Japan may be more useful than actual operations; for a Soviet attack might well end in a bad local defeat, whereas the threat ties down American forces that could otherwise be very useful elsewhere.†

peninsula about ten miles by coastal road from the town of Nemuro, which is the terminus of one branch of the Hokkaido railway. The islands are thus well within Japanese coastal waters. Though too small to hold any considerable body of troops, a modest force could be maintained on them, and a surprise landing on Hokkaido would be easily possible.

* Professor Andrey Karpinsky, a Russian geologist, stated shortly after reaching the United States in 1950 that this railway "had been completed before he left Russia in 1943, and that students of his had made the geological surveys for the road." Professor Andrey Karpinsky is a nephew of the late Alexander P. Karpinsky, a Soviet geologist and palæontologist who was president of the Soviet Academy of Sciences from 1917 to 1936. He was captured by the Germans at Piatigorsk in the Caucasus in 1942, was later sent as a slave labourer to Berlin, avoided return to the Soviet Union, and was brought to the United States by the International Rescue Commission from a displaced persons' camp at Schliesheim near Munich (*New York Times*, August 11, 1950). The National Geographic Society's map of the U.S.S.R. on the scale of 1 : 9,000,000 published in Washington in December 1944 shows this railway as running from Tulun (Nizhneudinsk) some 250 miles north-west of Irkutsk, north of Lake Baikal and north of the Trans-Siberian, through Komsomolsk to its terminus at Sovietskaya Gavan (Soviet Harbour) on the Pacific coast opposite Sakhalin. A map published in *L'Asie Soviétique* issued by the Direction de la Conjoncture et des Etudes Economiques of the Institut National de la Statistique et des Etudes Economiques, a body under the French Ministry of Finance and Economic Affairs (Paris, 1949, Presses Universitaires de France) shows this railway with approximately the same route, and with branches north to Nikolayevsk-on-the-Amur and south to Khabarovsk.

In any event Russia's present transport facilities in the Soviet Far East must not be underestimated. Besides the shipping which goes northabout Siberia during the summer, the Trans-Siberian railway at present "will handle about 17,000 tons a day in addition to its own tonnage maintenance requirements" (General Omar N. Bradley, Chairman of the United States Joint Chiefs of Staff, during the Senate MacArthur hearings; *New York Times*, International edition, May 24, 1951, p. 5, col. 4). Admiral Forrest P. Sherman, Chief of Naval Operations, United States Navy, added, it is true, that "the Trans-Siberian railway . . . is known to be already overtaxed" (*ibid.*, May 31, 1951, p. 4, col. 1). By way of comparison, when the Allies landed in Normandy on June 6, 1944, 326,547 men, 54,186 vehicles, and 104,428 tons of stores were brought ashore over the beaches during the first six days of the operation. The millionth man stepped ashore in France on D plus 28 (July 4). Apart from personnel landed, a million tons of stores and nearly 300,000 vehicles were put ashore by D plus 38 (July 14). At the end of August the Allied armies under General Eisenhower's command exceeded 2 million men. For them over 3 million tons of stores had been brought across the Channel, together with 400,000 vehicles (*Report by the Supreme Commander to the Combined Chiefs of Staff on the Operations in Europe of the Allied Expeditionary Force, June 6, 1944, to May 8, 1945* (London, 1946, H.M. Stationery Office), pp. 32, 66). For the three periods respectively the daily rates for the landing of stores only were 17,600 tons, 25,600 tons, and 34,500 tons—the first figure, about the present capacity of the Trans-Siberian, being sufficient to sustain more than 300,000 Allied troops during the early days of fighting in Normandy and yield something over for the subsequent build-up. In the case of the Trans-Siberian, the daily tonnage of stores carried would doubtless be reduced by vehicles and oil. There is, however, some oil in the Soviet Far East; while the purely military carrying capacity of the Trans-Siberian would be increased relative to the forces in the field because the Soviet Army "tail" is far smaller, both absolutely and relatively, than the Allied "tail" in Normandy. Too much should not be expected from Allied air attack, for distances in the Soviet Far East are formidable (from Vladivostok to Khabarovsk is about 400 miles; from Tokyo to Lake Baikal or Irkutsk about 2,000); but even allowing for some bombing, the Trans-Siberian alone could sustain a substantial scale of operations in its area, particularly in view of the supply dumps which the Russians are known to have there already; while if the Tulun-Sovietskaya Gavan railway exists, the position, from the Soviet point of view, is correspondingly improved. These figures are obviously also relevant to the scale of fighting in Korea.

† Against this reading of the situation however, may be set the very serious warning

This survey of possible ground operations may be summarised as follows: In the event of war a Soviet advance on Western Europe is certain; an attack on Yugoslavia and Greece is highly probable; an advance in the Middle East is likely despite serious difficulties; serious operations against Scandinavia and Turkey are unlikely, at least in the early stages; while a major amphibious landing on the main southern islands of Japan, though possible and a threat to both the Japanese and the West, would face air and sea hazards that make it unlikely.

In this survey the place of the war in Korea is reasonably clear. The North Korean attack may well have been launched in the belief that the West would take no serious action in reply, and that the Communist world could therefore clear another part of the mainland of East Asia and pave the way for further aggression without much cost or trouble. Chinese intervention may have followed on the calculation that the same objective was still attainable, if at a somewhat higher price. Whether or not the terrible casualties inflicted on the Chinese in the spring of 1951 will bring

implicit in statements of General Marshall's during the MacArthur hearings, when the following exchanges took place:

SENATOR STYLES BRIDGES. General Marshall, do you feel the Soviet is improving its military strength from day to day, week to week, month to month, year to year?

GENERAL MARSHALL. Those are the evidence that we get, and particularly in regard to its deployment . . . what has been going on behind the scenes has seemed to us to be a steady deployment in western Russia and in the Far East, notably in the Vladivostok region and Sakhalin Islands [*sic*] and places of that sort.

(*New York Times*, International Edition, May 9, 1951, p. 6, col. 3.)

And again:

SENATOR FLANDERS. I think you used the phrase "thousands of planes" in the Vladivostok region and large land forces on Sakhalin. Do you feel that the Russians are prepared for an offensive movement of some dimension?

GENERAL MARSHALL. I felt, from the information that has been given me from our various sources, that the Soviet had a considerable build-up in the Far East, which had been built up in a rather recent period, notably in Sakhalin, and the vicinity of Vladivostok, as to the planes, and Port Arthur and Dairen, as to planes. Now as to the build up of supplies, I don't recall exactly what has been given me, but as to the possible power of such a Soviet set-up, I have gotten the impression from the information, that it conveys a great threat to Japan, and it was that reason in particular that caused me to exercise considerable pressure to have the two divisions of the National Guard sent out to Hokkaido . . . the northern island, which comes very close to Sakhalin, and my own fears without recalling the exact details of the thing—my own fear was very great that our hazard was there, and we should terminate it as quickly as we could do it. (*Ibid.*, May 14, 1951, p. 5, col. 2.)

On the other hand, both General J. Lawton Collins, Chief of Staff of the United States Army, and Admiral Forrest P. Sherman, Chief of Naval Operations, were more confident, as the following exchanges show:

SENATOR SALTENSTALL. Now, have we got enough—are the two divisions in Japan sufficient, in your opinion, as from a military point of view, sufficient to hold Japan, having in mind the knowledge that you have of the dispersal of the Russian forces in the Far East?

GENERAL COLLINS. Yes, sir; in my judgment, in conjunction with the Japanese police forces that are being developed, and with our air and naval forces, I think that it is; that is my personal judgment. We have an overwhelmingly naval superiority out there, and I don't believe that any force can invade Japan in an amphibious operation or an airborne operation that would result in the fall of Japan.

(*Ibid.*, May 26, 1951, p. 5, col. 5.)

SENATOR CONNALLY. It has been said here . . . that the Soviet Union could not wrest control of the seas around Japan from us. Do you care to comment on that?

ADMIRAL SHERMAN. I agree with that, sir. . . . They could contest it, but we have sufficient naval power to prevent any other country from controlling the sea around Japan.

(*Ibid.*, May 31, 1951, p. 4, col. 2.)

the struggle to an early end cannot be foreseen at the time of writing. What is clear is that, while the Korean war continues, it ties down important Western forces in a remote theatre, forces them to fight at the end of long supply lines, and uses Chinese troops (and to some extent Chinese resources) while husbanding Soviet manpower. The Korean war therefore plays a valuable part in the Soviet strategy of multiple fronts; its usefulness would increase with any further development of that strategy; and it is certain that it will not be lightly abandoned.*

But will Soviet Russia herself to go war in the near future? One argument may be swept away at once. This is the view that the Russians are an essentially peaceful people and that Russia as a state does not like to go to war. There could be no worse founded or more pernicious illusion.† Even less attention need be paid to the view (if still held by anyone except Communists, fellow-travellers, and dupes) that Soviet policy and the huge Soviet armed forces are merely defensive. After all, a sensible man does not need to wait until he is being throttled before recognising his enemy. The truth is very different. Any hesitancy in the Kremlin about the immediate course of Soviet policy—if, indeed, there is hesitancy at all—can arise only over estimates of the chances of success. If the Kremlin feels certain of victory, it will go to war; if the

* This chapter (except parts of certain footnotes, as indicated) was written and completed in May 1951. The negotiations for a cease-fire in Korea which began early in July, though obviously of value in the scheme of Communist political warfare, made no change in the text above necessary down to August 12, 1951.

† This view is held among others by writers as well informed as Mr. Edward Crankshaw and Miss Barbara Ward. Mr. Crankshaw writes: "One of the many Russian paradoxes is that the most expansionist power in the world is also one of the least belligerent powers in the world. This is not because Russia has, or ever has had, any moral scruples about going to war: she has none at all. It is simply because she does not like going to war." And again: "The Russian people do not like war, they have never liked it, they have had a great deal of it." (*Russia by Daylight*, pp. 56, 146.) Miss Barbara Ward writes: "The Russian tradition is certainly not one of wilfully launching general war. By inept policies, by fishing in troubled waters, by pursuing limited expansionist aims on the side, the Russians have usually managed to involve themselves in whatever general wars occurred, but they have not precipitated them and they have always suffered horribly from them." (*Policy for the West* (Harmondsworth, Middlesex, 1951, Penguin Books), p. 20.) These passages contain various loopholes which cannot be stopped in a short note (e.g., whether Russia, or the Russian people, "like" war or going to war; whether Russia has "precipitated" not only wars but "general wars", and whether she has done so "wilfully".) Nevertheless, the historical record is sufficiently clear. From 1480, when the Tartar yoke ended, to the beginning of the First World War in 1914, Russia has been involved in at least 50 wars, an average of more than ten to a century (the exact number depends *inter alia* on how the wars of the Napoleonic period are reckoned)—five against Lithuania and the Livonian Order, nine against Sweden (and Sweden's northern allies), one against Poland and Sweden, five against Poland, the Seven Years' War against Prussia, the Napoleonic wars (here counted as one), four against the Khanate of Kazan, seven against the Khanate of the Crimea, one against Astrakhan, nine against Turkey (and various allies; these include the Crimean War), two against China (including the Boxer Expedition), one against Japan, two against Khiva, forty-two years of other wars in Central Asia (1842–84), forty-eight years of cruel and bloody war in the Caucasus (1816–64), and four wars against Persia. This excludes the campaigns against three Polish insurrections and against Hungary in 1949. It also excludes the internal wars (or, at the very least, the serious fighting) of the Time of Troubles (1604–12), and the fighting involved in the risings of Stenka Razin (1667–74) and Pugachev (1772–4). Before 1480, though the political units were different, the picture is substantially the same. Indeed, it is scarcely too much to say that the Russians have been fighting since they first appeared in historical records; and that, though they may sometimes have required or submitted to foreign rulers (the Varangians, the Golden Horde), they have amply supported all rulers, whether home-bred or of alien stock, who have led them well in battle. To hold that the Great Russians are a peaceful people is not only to libel one of the great fighting stocks of mankind, but is also in present circumstances to spread a legend immensely dangerous to the West and to the whole cause of human freedom.

chances seem doubtful, it may wait. On an ultimate analysis there can, from the Soviet and Communist point of view, be no other choice.

In deciding on the prospects of Soviet victory four questions are critical. How long a war must be contemplated? Will the Russian people stand the strain of war without overthrowing the Soviet regime? How does the time factor affect Soviet and Western armed strength respectively? If the Kremlin waits, will the political situation change, the "contradictions" of capitalist society develop favourably, and a continuance of the "cold war" offer in the future a better promise of success?

There can be no convincing estimate of the probable length of a third world war; but the Soviet leaders must clearly hope, if they can overrun Western Europe quickly, seize the vital oil supplies of the Middle East, attack Britain with both conventional and atomic bombs, isolate or partially isolate Britain at sea, inflict heavy losses on British and American sea communications, atom-bomb American cities and major production centres, and seize American bases from which atomic attacks on Soviet territory can be launched, that Britain will be quickly knocked out or brought to surrender, and that the United States, shaken by devastation and casualties and appalled by the costs of continuing to fight, will soon call off a struggle which in such circumstances would fall on it practically alone. As regards Russian endurance, if events took such a course, the Russian people would not have to face over-great or prolonged strain; while even if events shaped less favourably, the Soviet regime must feel fairly confident that it can survive the buffets of fortune as long as the will of those at the top remains resolute and the M.V.D. (formerly the N.K.V.D.) and the forced labour camps exist and the vast Soviet apparatus of oppression and terror remains loyal to the Kremlin.

The time factor in relation to Soviet and Western armed strength is a little clearer. The West is definitely not capable now of withstanding existing Soviet conventional arms.* The present Russian advantage cannot

* This was the unanimous opinion of General Marshall, the Secretary of Defence, of General Omar N. Bradley, Chairman of the Joint Chiefs of Staff, of General J. Lawton Collins, Chief of Staff of the United States Army, of Admiral Forrest P. Sherman, Chief of Naval Operations, and of General Hoyt S. Vandenberg, Chief of Staff of the United States Air Force, as given before the Senate MacArthur hearings in May 1951. The relevant passages from their testimony follow (the quotations come from the report—in the main a verbatim report—printed in the International Edition of the *New York Times* on the dates given below).

SENATOR BRIDGES. Now, General, supposing that the worst should happen and that Russia should override Europe and the skills and resources of Europe became at Russia's disposal, would in your judgment then Russia be able to threaten the security of the United States?

GENERAL MARSHALL. I think very clearly they could do so. That would be a terrific loss to us.

SENATOR BRIDGES. At the present time do we have enough strength in Europe to prevent that?

GENERAL MARSHALL. Not at the present time. We have enough to start them to think before they leap, and of course we have an atomic advantage that they are aware of. (May 9, 1951, p. 6, col. 8—p. 7, col. 1.)

SENATOR JOHNSON. Would you care to comment on . . . our ability to meet the challenges of the global problems as they may be presented?

GENERAL MARSHALL. We are gathering our strength as rapidly as we can, and we certainly do not want to become involved in a world struggle at any time, and certainly not prior to the time we are reasonably prepared to meet it.

SENATOR JOHNSON. You do not think that we are presently [at present] prepared to meet it? . . .

GENERAL MARSHALL. I am quite certain we are not. (May 11, 1951, p. 7, col. 2.)

be maintained, however, for if the pace of American rearmament continues, the differential in the Soviet favour should be materially reduced during 1952, while during 1953 the two sides should draw approximately abreast. European rearmament, even at the present rate (which there are most grave reasons for regarding as far too slow), should develop similarly; by 1953 it might even be possible to see an end to Western Germany's defencelessness; so that by that year at latest the threat of a virtually unimpeded Soviet advance to the English Channel and the Atlantic should be ended. In other words, considering the Russian and Western rearmament curves from 1951 onwards, and even allowing for some future increase in the Soviet armed forces, the Soviet advantage in conventional

SENATOR WAYNE MORSE. Is it true that our present state of mobilisation and our present defences is in such a condition of inadequacy at the present time that . . . if World War III on a world-wide basis should break out in the immediate future, there is a serious danger that a considerable number of the enemy planes would be able to break through our defences and deliver their bomb-loads on American soil?

GENERAL MARSHALL. I think that is correct, sir. . . .

SENATOR MORSE. Are we not, General, short of trained military manpower at the present time to a very serious degree?

GENERAL MARSHALL. Yes, sir.

SENATOR MORSE. And is it not also true that we are short of modern equipment at the present time to a serious degree, including planes, tanks, and other military equipment?

GENERAL MARSHALL. Yes, sir.

SENATOR MORSE. Is it not true that our allied strength is in exactly the same condition of inadequate preparedness at the present time?

GENERAL MARSHALL. Much more so. (May 11, 1951, p. 7, col. 8.)

GENERAL BRADLEY. . . . The twelve treaty nations of the North Atlantic Treaty Organisation do not have the capability, right now, of stopping an aggression by the Russians. (May 25, 1951, p. 5, col. 5.)

SENATOR JOHNSON. In your judgment, do we and our allies have sufficient forces in Western Europe to fight a successful holding action in the event the Soviet moved soon?

GENERAL COLLINS. . . . My answer to your question . . . would be, no, that the Western powers do not have sufficient forces as of now to hold Western Europe in the event of an attack by the Russians.

SENATOR JOHNSON. General, from an overall standpoint of the disposition of our forces throughout the world, are we sufficiently strong to fight a successful holding action in the event the Soviet Union attacks at an early date?

GENERAL COLLINS. Not as of the moment; no, sir. That applies particularly to Europe. I think that we have sufficient forces out in the Far East to hold there. I think we have sufficient forces in Alaska to hold there. I do not think we have sufficient forces in Europe. (May 26, 1951, p. 5, col. 7.)

SENATOR JOHNSON. Do we have a sufficient air power available to carry out our commitments to Europe?

GENERAL VANDENBERG. To-day, no, sir. (May 29, 1951, p. 4, col. 6.)

SENATOR CONNALLY. If Russia should enter the war, could we, Admiral—have we got the present capacity to knock out her installations, shipbuilding facilities, and fleet?

ADMIRAL SHERMAN. We have enough power to do that in the Far East, but in the course of that operation we might lose forces that were much more important in Europe and the Middle East. I do not believe that the Western world is ready for a general war at the present time. (May 31, 1951, p. 4, cols. 2-3.)

armaments would appear to be at a maximum now.* As regards atomic weapons, the position is reversed—at least so far as can be judged from the exiguous information hitherto published. Here the American stockpile of atomic bombs is certainly superior to the Russian. On the other

* In a statement on July 27, 1951, Mr. Emanuel Shinwell, the Minister of Defence said:—

"At the end of the War Russian production of armoured fighting vehicles was running at 30,000 a year. Their Air Force possessed 23,000 aircraft and there was a production capacity of 40,000 aircraft a year. There were 215 submarines in their Navy.

"Today, the combined manpower strength of the Soviet Armed Forces—that is to say the Army, Navy and Air Force and Security Troops—amounts to 4,600,000. Add to this a force of 1,070,000 men in Eastern Germany and the satellite countries and you get a total of well over 5,670,000. This is a formidable force, far beyond what any one country or group of countries could ever require in peacetime. The Soviet Army alone comprises some 3,200,000 men and women. They are organised in 175 line and active divisions. In addition they have another 40 anti-aircraft and artillery divisions which are in support making a total of 215 divisions. That total figure could of course be doubled on mobilisation.

"Not all these forces are arrayed immediately against the West. But there are known to be 22 divisions in East Germany, of which 18 are armoured with a total war strength of 5,000 tanks. A further 4 armoured divisions are near at hand. You must add to this about 70 divisions of the satellite armies. They include an increasing proportion of tank and mechanised divisions.

"You can take the strength of a Russian or satellite division at round about 12,000 men. The proportion of armour is very important. One-third of their active divisions are armoured or mechanised. The Soviet output since the War of armoured fighting vehicles has been at the rate of over 5,000 a year. 25,000 tanks are already with the armed forces, and a similar number are already in reserve.

"Included in the overall figure of the combined Russian strength, are 800,000 men in the Air Force. They have at this moment something more than 19,000 aircraft. The Soviet Union's production of all types of aircraft, of which by far the greater number is for military purposes, is at the rate of about 10,000 a year. This includes a large and increasing number of jet fighters and bombers.

"The Soviet Air Force is divided into separate formations for the support of army and naval operations, home defence and long-range bombing and reconnaissance. Of course its fields of possible operations go far beyond Western Europe. However, there are at present some 350 airfields on the western perimeter of the Soviet bloc, a number of which are under active and continuous development for the latest types of aircraft. These airfields together could accommodate between 14,000 and 17,000 aircraft. The number and size of airfields in this area are being steadily increased.

"The satellite air forces are very much smaller. They have a total manpower strength of 50,000. They have a total aircraft strength of about 1,100. Thus you get a figure of 850,000 for the total manpower strength of the combined Soviet and satellite air forces and a total aircraft strength of over 20,000.

"The total Russian strength in manpower also includes about 600,000 men in the Soviet Navy. The Soviet Navy disposes of a powerful and modern fleet which includes some 300 submarines, many of them of modern design. The submarine, I might point out, could hardly be called a defensive weapon for a land power such as Soviet Russia. The total manpower strength of the satellite navies is around 20,000.

"Finally, let me give you one or two figures about Soviet industrial production. The current annual output of crude steel is 27·6 million tons. The current output of oil in the U.S.S.R. is 37·8 million tons. In coal, Russia has an annual production rate of 264 million tons, compared with the United Kingdom's 1950 production of 219·8 million tons. Russia, with a population four times that of the United Kingdom, devotes only 6·7 million tons, or 2·3 per cent of her coal resources to domestic use, as opposed to the 35 million tons, or 15·3 per cent of the United Kingdom in 1950. In electric power, the current Soviet output is 90,000 million k.w. In the United Kingdom we have a total output of 55,000 million k.w. In all, 13 per cent of the national income of the U.S.S.R. is devoted to defence expenditure—and this is only a declared percentage of her expenditure on armament. Undeclared expenditure may make the total considerably greater.

"That is a brief review of Soviet military power: a huge army, an expanding air force, and one of the largest submarine fleets that have ever been in existence."

In answer to a question, Mr. Shinwell added: "Soviet armed strength is formidable and still going up—still going up certainly, I mean, for example, their tanks."

hand, if Russia has at present enough atomic bombs to do the damage to Britain and the United States which plans for a short war would require, the much larger and stronger American stock-pile need not act as a deterrent to early Soviet action. Taking conventional and atomic armaments together—and assuming that the Russians have now a necessary minimum of atomic weapons—the time factor would appear to give the Kremlin its best hope of success from action in 1951, to make its chances markedly smaller in 1952, and, provided no new major factor is introduced, practically to wipe them out from 1953 onwards.*

The prospects of "cold war" after 1953 are even harder to estimate. World Communism cannot gain much more from a simple alliance with Eastern nationalism, but must encounter increasing resistance to attempts to suborn or subvert Asian regimes to Soviet purposes. The power-vacuum in the Middle East cannot be greater in the future than to-day. As Western Europe recovers health, the strength of Moscow-controlled Communist Parties and movements should decline—the more so because

This estimate of Soviet strength is the highest and most detailed so far officially given. A year earlier, on July 26, 1950, Mr. Shinwell told the House of Commons that the Soviet army comprised "some 175 active divisions" and had "2,800,000 men under arms." Apart altogether from the number of divisions, this year's statement by Mr. Shinwell shows an increase in the official estimate of some 400,000 effectives, or more than 14 per cent., in Soviet Army strength alone. Last year Mr. Shinwell referred only to "about 25,000 tanks" without mentioning the "similar number" now stated to be "already in reserve." (For the statement of July 26, 1950, see House of Commons, *Official Debates*, vol. 478, col. 471.)

On the other hand, there is reason to think that Mr. Shinwell's estimate of the numbers in the satellite forces is on the low side. Mr. Vladimir Dedijer, Secretary of the Foreign Policy Committee of the Yugoslav National Assembly, stated in London on July 15 that Hungary, Rumania, and Bulgaria together then had more than 830,000 men under arms, or more than three times the numbers allowed under the peace treaties signed with them (*Daily Telegraph*, July 16, 1951). To these Hungarian, Rumanian, and Bulgarian forces must be added the Polish and Czechoslovak armies, totalling together between 400,000 and 700,000 (see *The World Today* (London, Royal Institute of International Affairs), June, 1951, p. 233), and some 60,000 members of the East German *Bereitschaften*. These figures for the Soviet satellites certainly omit the very large Chinese armies still uncommitted in Korea, and probably omit the strong and well trained Outer Mongolian forces, including trained tank and air units.

It is not feasible to give a corresponding survey of the strength of the North Atlantic Treaty Powers; but, as far as Germany and Western Europe and the main N.A.T.O. countries is concerned, the position in the summer of 1951 is that there were by the end of the year to be four and one-third British divisions in Germany (two of them armoured); there were to be six United States divisions in Europe by the end of 1951; while M. Moch, the then Minister of Defence, stated on May 6 that by the same time France had undertaken to have five divisions on a war footing, and five others available at three days' notice. Of the first five, M. Moch added, four divisions up to establishment were then either in Germany or on the frontier. (*The Times* (London), May 7, 1951.)

* General Vandenberg's view of the time factor is more sombre. He stated categorically during the Senate MacArthur hearings: "To-day the air defences of this country are about adequate. To-morrow they will not be nearly adequate enough." In the following exchange he made clearer what was in his mind:

SENATOR JOHNSON. General, do we have the air power to give American cities a reasonable defence against atomic attack, in the event of a war with the Soviet Union to-day?

GENERAL VANDENBERG. To-day, yes, sir; but not to-morrow.

More generally, he explained that "starting from a forty-odd group air force, the aircraft industry is unable until almost 1953 to do much of a job towards supplying the airplanes that we would lose in war against any major opposition"; and on the following day he added: "My feeling is that the danger period is from to-day until about 1954, and in my opinion in 1953 we will be beginning to have an adequate military posture. I would not say that in 1953 everything will be lovely by a long shot." (*New York Times*, International Edition, May 29, 1951, p. 4, col. 2, col. 6, and col. 2; May 30, 1951, p. 4, col. 5.)

of the spread of Titoist tendencies in many countries. All over the world Communism's attractiveness for the masses is dwindling as increasing knowledge blows the Communist Utopian mirage away, and as behind it appear the ugly and menacing realities of Soviet imperialism, the Communist terror, and the practice of forced labour on a gigantic scale wherever Soviet power sets its heel. Moreover, within the Soviet empire itself tensions and hatred of the regime are rising. On a long view, therefore, the remoter prospects of the "cold war" may perhaps be judged with a certain scepticism even by cooler heads in the Kremlin, and certainly by those in the West with the eyes to see and the will to handle Western affairs properly.

Even if correct, this analysis is still insufficient to prove that Moscow will in fact face the hazards of a third world conflict. The men of the Kremlin may lose their nerve. They may think the chances of victory too small to outweigh the certain risks of war. The terrible casualties which American arms inflicted in Korea in the spring of 1951 may strengthen other voices which urge caution. Alternatively, Stalin may feel that he must act while he still has strength; or, on the other hand, if he should die in the near future, a fierce internal struggle for power might paralyse the Soviet Union and the whole Communist world. As regards all such possibilities, time alone can decide. Certain truths remain, however, and seem beyond challenge. The present generation of Communist leaders will never abandon their purpose of seeking world revolution and a Soviet-dominated globe. They will not hesitate to use force *if they feel confident that it will succeed*. No moral scruples will restrain them now or in future. Consequently while the Soviet Union remains powerful and the focus of world Communism, the Communist threat, though it may abate for a time, will never finally cease to menace the existence, the life, and the welfare of all other states and the whole of mankind.

III

Space does not permit more than very brief and dogmatic comment on Western strategy. The essential propositions are six:

(1) The Soviet regime, with its power over the peoples under Soviet rule, its secret police and its apparatus of oppression and terror, is the real enemy. As in the case of Hitler Germany, the regime, though possibly self-destructing in the end (a consummation greatly to be wished), cannot be overthrown in an early future except by defeat in war. Apart from the unpredictable effects of atomic bombing, this means either (a) bleeding Soviet armies to death and disintegration as Tsarist armies were bled and disintegrated during the First World War, or (b) the actual conquest of Russia; and also (c) using political warfare to the full, as indicated in (4) below.

(2) Napoleon's and Hitler's failure are not conclusive proof that Russia cannot be conquered by attack from the West. During the spring thaws all movement is paralysed (including that of Russian armies); but otherwise the military problem resolves mainly into unfamiliar and most difficult problems of logistics and cold. Those problems, however, are not insoluble; and serious work on them should be put in hand at once.

(3) In Western global strategy there are six vital areas—the United

States, Britain, Western Europe, the Middle East (particularly the oil fields), Japan and the island chain off East Asia, and the oceans. All other possible theatres are secondary. These truths should govern all major dispositions of Western forces.

(4) There can be no substitute for Western military strength and (in the event of war) victory in the field. Political warfare, however, is less important only than these. The Communist world is a perfect field for its employment. Hatred of the regime is intense and widespread even in the Soviet Union; it is relatively stronger in the European satellites, which are being bled white by Soviet exactions; it is already strong in China, and will become stronger as the Communist regime resorts increasingly to terror and oppression. Consequently the right kinds of political warfare rightly used (vastly more than radio and other propaganda is involved) can make a major contribution to the victory of the West. Here also immense problems—problems of strategy as well as of tactics and methods—proper consideration of which has not yet even begun, call urgently for solution. This work should likewise be put in hand at once.

(5) Besides political warfare against external objectives, great internal political problems will, in the event of war, arise in the West from the Soviet-organised and directed Communist Parties and organisations, overt and covert. Sabotage, spying, and other troubles must be expected. They may be of a most serious character, *and will certainly be most carefully timed*. All this must raise problems very hard to solve within the framework of a democratic state and currently accepted liberal and democratic ideas and principles. These also are matters urgently requiring thought and discussion.

(6) The post-war *political* objectives of any future struggle against Soviet Russia and world Communism should be borne in mind from the start. The victors do not want yet again by great effort and greater suffering and sacrifice to create fresh power-vacuum in which new though differently centred forces of anarchy and aggression can once more thrive. This means that the West must on this occasion take thought in time—and back its thought with will. It also means clearing anew the foundations of Western faith and wielding once more that sword of the spirit which the crisis of our time has stained and blunted.

JULES MENKEN

CHAPTER V

SOUTH-EAST ASIA IN THE MELTING-POT

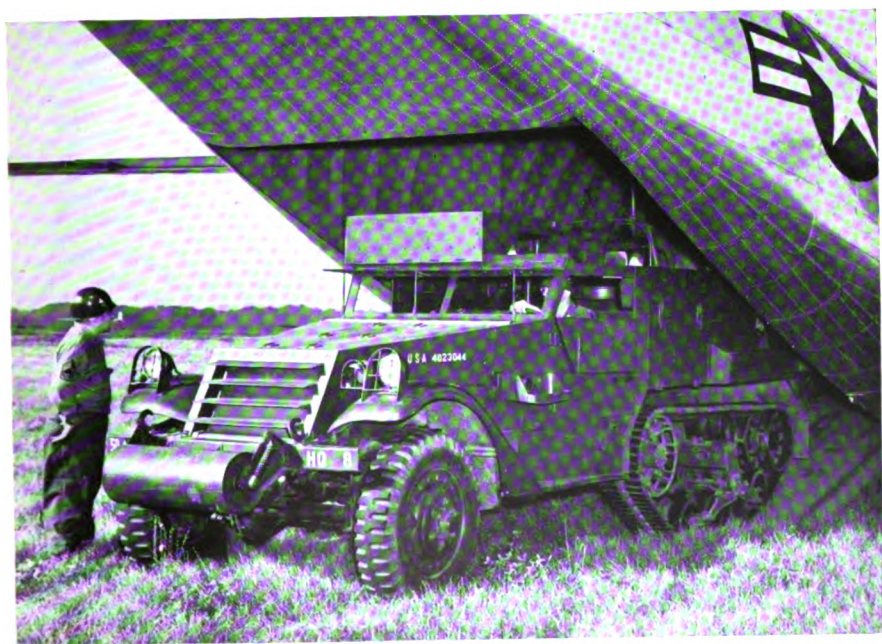
THE STRETCH of territory from Pakistan to Japan may be divided into three strategic regions—the Indian sub-continent, South-East Asia, and the environs of China. At one end, in Pakistan and India, the British still form a close link with that Anglo-American partnership on which the peace of the world depends. At the other end, in Japan, the Americans dominate the scene. Somewhere between them there is a kind of No Man's Land at which it is possible to look in two ways. One, the British approach, is to reflect upon the several important reasons why the area itself—Indo-China, Siam, Malaya, Burma, and Indonesia—should not be allowed to slip any further than it has already into Communist hands. The other, which has tended at times to be the American approach, is to argue that in terms of the global strategy of the Western powers South-East Asia is expendable. If it cannot be held, that is to say, without making gravely excessive sacrifices elsewhere, then no serious attempt should be made to hold it. And this must affect the strategy envisaged for the whole Western Pacific on the one hand, and for the Indian Ocean on the other.

These two attitudes may seem at first sight to be the opposites to those which are customarily attributed to London and Washington. In the long-standing clash of British and American policies in the Far East, which has come much further into the open since General MacArthur was dismissed, it has usually appeared to be the Americans who favour taking a strong line—no recognition of Communist China and the placing of the United States Seventh Fleet across the invasion sea routes to Formosa—while it is the British who have taken the more moderate line of trying to come to terms with Peking. This apparent contradiction, however, is in reality only a question of how the fundamental interests of the West are to be interpreted from day to day and from month to month, a fact which has been more clearly appreciated by both sides since the shake-out in the policies of both London and Washington following the great debate after the MacArthur dismissal, and since the actual differences have become narrower than they were.

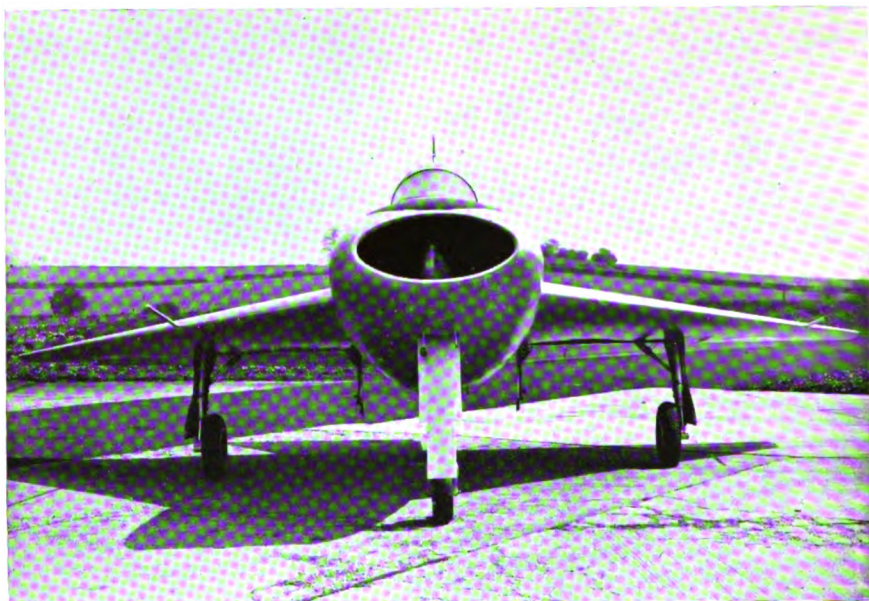
The interpretation of interests certainly changes from one year to another under the pressures of expediency and of political sentiment at home. Three years ago, for instance, when the British were already fighting in Malaya and it looked as if the enforced withdrawal of the Dutch from the Netherlands East Indies might leave a vacuum that would be filled by the Communists, the Americans in Tokio had virtually written off the whole of South-East Asia as untenable. But this did not make them any the less determined to fight Communism where they thought they could do so successfully—in China and Japan. Nor did Britain's resolve not to lose Malaya a second time, and its concern at the way events were developing in the rest of South-East Asia, mean that London would not consider it proper and expedient to try to establish diplomatic relations



Boeing L-15A Air Observation Post aircraft. "Can take off from a dollar bill"



Loading ramp of a Chase XC-123



Boulton Paul P-III Experimental Delta Jet Aircraft



Glenn Martin KDM-1 Plover. (Radio-controlled target with 20-in. Marquarat Ramjet)

with the Chinese Communists when they came to power in Peking; the fact that this policy has since proved useless in the face of Chinese intransigence does not mean that it was a mistake to try it, or indeed that anything was lost by doing so.

The truth is that now the Western powers are being forced to combine more effectively in their policy of resisting Communist imperialism and now that their positions in the Far East have come closer together in recent months, there is less difference than might appear at first sight between the two ways of looking at South-East Asia. In Washington the problem is seen in a different light from that of three years ago. The Americans now consider that while they themselves are not the power primarily concerned in South-East Asia—although their influence is gradually ousting that of the British in a country like Siam, for instance—the United States cannot afford to write off the area as untenable; Washington must somehow find ways of helping the British, the French, the Indians, and Pakistanis, and the national governments in Burma, Indonesia, and Siam, who are the people primarily concerned. Accordingly, the Truman Administration has already allotted \$91 million for economic aid throughout South East Asia, has granted a loan of \$100 million to Indonesia, is helping Siam with arms, has been pouring military supplies into Indo-China to the value of \$275 million in the year ending June 30, 1951, and has been considering indirect support—if no more than that—to the Colombo Plan.

This central region of southern and eastern Asia must, in fact, provide some of the main clues to the West's strategic needs and possibilities in the Indian and Chinese (or Western Pacific) regions on its flanks. How far can it be held against Communism? What has been happening there during the past year and a half? Before turning to the second question, a broad statement of principle should be borne in mind in answer to the first. South-East Asia is worth a tremendous effort by the Western powers in men and money and ideas so long as the struggle there is limited to the cold war. This area is not, however, worth trying to fight a major campaign over once an open world war has broken out. The reason is simple. South-East Asia lies on the raw materials axis of Western industry; it is therefore worth a great deal in the cold war, quite apart from its strategic position and its manpower. On the other hand, no world war is going to be won on the tropical fields of South-East Asia, and much of it might have to be abandoned in a last ditch struggle; the last war proved that the West could scrape through without it.

South-East Asia is a geographical rather than a political or economic term. The five countries, Burma, Malaya, Indonesia, Siam, and what are now known as the Associated States (*Etats associés* in the French Union) of Indo-China—Vietnam, Cambodia, and Laos—have no common heritage, language, religion, way of life, or dependence on mutual trade except to some degree in rice. They are contiguous on the map, and there in a sense the matter ends. Nevertheless, it is not in one very significant sense the whole truth. In spite of the great physical barriers of mountain, jungle, and sea which separate these countries, they do increasingly echo to the same taps of political fortune. There is, that is to say, a growing tendency for people in Rangoon or Singapore to know

and react to events occurring in Saigon or Jakarta, for the similarity of their own recent experiences to impose a sense of common destiny after all. This is not a matter of history so much as a result of the pressure of events in the lifetime of the present generation. For all South-East Asia, except Siam, has had one experience in common—pre-war colonial rule. And the whole area, including Siam, has lived through the revolutionary period of Japanese occupation, followed by Japanese defeat and by the vain post-war attempts to re-establish what had gone before.

South-East Asia to-day is an area of weakness, militarily ineffective and largely incapable of self-defence. It is a power vacuum in a manner which did not hold true before the war. The reasons for this are two-fold. Before the war, to molest any of the countries in South-East Asia was to start aggression against the Western colonial powers which ruled there. The British were firmly based in Malaya, Burma, and Borneo and also exercised a very wide influence by virtue of their Indian Empire. The French, still—it may be recalled—at that time regarded as a great power in Europe, held a peaceful Indo-China in their firm grip. The Dutch reigned confidently in a prosperous Netherlands East Indies. And nearby the Americans still flew their own flag over the Philippines. To-day nearly all this has gone. The British are hard pressed in their chief remaining foothold, Malaya. The French have their backs to the wall in Indo-China. And the Dutch are left with only a primitive little holding in western New Guinea, a liability rather than an asset. The Philippines, too, have thrown off American sovereignty, although it is true that the United States, itself a power of much greater stature than before the war, has military bases in the islands. These Western powers, moreover, in addition to being militarily on the defensive, are widely discredited politically.

The other reason for weakness is that South-East Asia is going through a period of revolutionary change which is still far from complete. The upheaval of Japanese conquest and the defeat of the colonial powers was something which shook the people of South-East Asia very deeply. After it their relations with the white races could never be quite the same again. It was not that the Japanese ever succeeded in gaining much loyalty or support for themselves, but rather that, by destroying the old order, they showed that there could be a new one. This opened the way to the two forces which between them have shaped nearly all the events that have taken place in South-East Asia since the war—nationalism and Communism.

From the point of view of Western interests Asian nationalism is not an entirely unfavourable force. The essential need is to recognise its strength and its progress, and to act with a sense of reality, as the British, to their eternal credit, did in India. Many of the leaders of the nationalist movement in South-East Asia are anxious for all the help that they can obtain from the West; they know how desperately badly they need to develop their economies in order to raise the living standards of their people. They also know the dangers for themselves if, in the face of the new totalitarian imperialisms in Asia, they fail to make a success of the independence for which they have fought. This is particularly true of Indonesia, where the second of the two forces, Communism, constitutes a perpetual threat to the present nationalist leaders, even though there is

at present no organised Communist rebellion going on against the government as there is in Indo-China and Burma. For the aim of the Communists throughout South-East Asia is to gain control of the nationalist movements for themselves. Sometimes their policy is to try to seize the leadership before nationalism achieves independence, as with Ho Chi-minh in Indo-China, or as they tried and failed to do in Indonesia. Sometimes the Communists know they are too weak to plan an attempt to take over until after independence, as in Burma and indeed in India. But there could be no greater mistake for Western statesmen than to oppose the nationalists on principle. This drives them into the arms of the Communists.

At the same time, one of the still unsolved problems of South-East Asia to-day is to know how the West can satisfactorily work along with leaders, without their association with it undermining their hold on their own people; if this is too close, it simply strengthens the anti-Western left wing. The answer, which the French have so far failed to find with Bao Dai in Indo-China, though they have lately tried to do so seriously, must lie along the path of combined moderation, recognition of the facts, and sympathy for a people's national ambitions.

With this background in mind some estimate can be made of the continued seriousness of the disturbances in South-East Asia during the past year, and of the extent to which their probable future course must affect Western strategic thinking in the Indian Ocean and in the Pacific. The key to South-East Asia is Indo-China, or rather that part of it which is now called the Republic of Veitnam. For if Indo-China were lost to the Communists, Siam would not find it easy to avoid making a sharp change of government and a deal with Communist China. And if Siam went, the defence of Malaya would become infinitely more difficult. If the British lost in Malaya, Communist prestige would certainly gain so much as to sweep away the struggling nationalist government in Indonesia and reach the sea frontiers of Australia; on the western side, Burma would be in much greater danger even than now and India would be gravely threatened. And all this would be in addition to the extra direct military assistance to South-East Asian Communists which an expansionist China might give, a China that had set the political ninepins falling in the first place through its successful aid to the Vietminh—the "League for the Independence of Vietnam."

The low-water mark of resistance to Communism in Vietnam was last December; and it is a remarkable fact that the very considerable French and pro-French Vietnamese recovery which has since taken place has, up till the time of writing, passed relatively unnoticed by the world at large. This recovery has, of course, been overshadowed by the war in Korea, which has become of immense psychological, and so political, importance throughout South-East Asia. Korea has also played a distinct part in assisting the French military recovery in Indo-China, by making the Chinese hesitate to commit themselves on any serious scale to yet another foreign adventure, such as pouring in "volunteers" in addition to the arms and training assistance which have in fact been given to assist the Vietminh. Yet the struggle of Indo-China is intrinsically much more important in terms of world strategy than that in Kroea.

The main reason on the spot for the vivid change in French fortune in

Vietnam during the past few months of 1951 was the appointment just before Christmas 1950 of General de Lattre de Tassigny as both Commander-in-Chief and High Commissioner; he in fact declined to accept the military command unless he could also have political control. General de Lattre rapidly achieved four things. First, by injecting his own fresh and confident personality into what had become a dangerous mood of defeatism, he revolutionised morale on the French side. Secondly, he reorganised his forces on the basis of mobile instead of regional commands. Thirdly, he tremendously tightened up security, partly by cutting down the vast number of written orders and by increasing the frequency of small high-level conferences between commanders at which all instructions were given orally; security had got so bad that the Vietminh intelligence always knew what the French were going to do next. And last, General de Lattre made far more effective use of his artillery than his predecessor had done; he was, moreover, now beginning to receive a new and sizable flow of American equipment.

The result of these developments was that the Vietminh rebels, who had been building up for an all-out offensive aimed at capturing Hanoi, the key capital city of Tongking, evidently decided to strike before they were ready. Instead of waiting for the *crachin*, a season of mists normally lasting from late January to about mid-April and in which air operations are difficult for the French, they launched about 40,000 men against the government troops early in January. This was by far the biggest battle that had yet taken place in the Indo-Chinese war and its outcome was crucial. If the Vietminh could capture Hanoi their victory would not only echo round the whole of South-East Asia but would probably lead to the French evacuation of the northern province of Tongking by sea and would gradually double the pressure on Saigon down in the south.

In the event, General de Lattre won a great victory. Hanoi was held. The Vietminh suffered about 8,000 casualties and then retired to re-form. The great question was whether they would come on again by themselves or wait for more open and extensive help from the Chinese—whom, however, most Annamites in Vietnam heartily dislike and tend to fear. Eventually the Vietminh launched another offensive on their own at the end of March, after collecting all their available trainees—about 20,000—from the Chinese-run training camps over the border in the provinces of Kwang-si and Yunnan. This too was beaten off, and towards the end of April, when the rainy season was about to close down on Tongking, making major campaign actions difficult until October, the Vietminh radio gave instructions for the struggle to revert to guerrilla warfare.

In this breathing space the twin tasks of the French have been to consolidate their military gains by training and equipping a much larger Vietnamese Army—it has doubled to 60,000 men since the end of 1950—and to convert the military success into greater political confidence in the Bao Dai regime. The building up of a Vietnamese Army has been going well. General de Lattre has pushed Paris into accepting a far more rapid development than any previously considered; this is the only possible policy which will ever enable the French to pull their own troops back for the defence of Western Europe without abandoning the anti-Communist government of Bao Dai to an inevitable fate. On the political front, however, the situation throughout Indo-China still leaves a very

great deal to be desired. As the new High Commissioner, General de Lattre has tried to present the people of Indo-China with an attractive picture of complete independence in association with the French Union. He has tried, that is, to change the attitude of suspicion of French motives which has bedevilled Indo-Chinese politics ever since the war; and in so far as he has overcome the initial distrust of the very fact that he himself, as a general, may represent a throwback to the period of French colonial imperialism, he has succeeded. But there are still a great many Vietnamese sitting on the fence in the struggle between French-sponsored Bao Dai and the Communist leader, Ho Ch-minh. And it will take more than a tactical victory in Tongking, a successful United Nations' holding action in Korea, or indeed a flow of fine French phrases to bring them down on the anti-Communist side. Not only must the Communists appear to be losing; time must be made to show that the French mean what they say in withdrawing their civil servants and their soldiers, and in proposing complete Vietnamese independence. The struggle is one in which the French are necessarily acting against the whole trend of their own colonial policy, as well as trying to solve the problem of Asian nationalism in a way for which there has so far been no precedent. It is small wonder that since so much in South-East Asia depends on the outcome in Indo-China, the future of this whole area still hangs by little more than a thread.

Next door to Indo-China, the Siamese have been outwardly ready for about two years to co-operate with the United States and Britain in opposing Communism. They were led into this policy by their benevolent dictator Field-Marshal Phibun Songgram, who strikingly confirmed his alignment with the Western powers by an unexpected and indeed "un-Siamese" offer to send troops to Korea the moment he was asked to do so last year. There are, however, four important considerations to be borne in mind over the Siamese situation. First, the continuity of Marshal Phibun's policy depends on his own hold on power; if he were thrown out, his successor would almost certainly come from among the followers and associates of his traditional rival, Pridi Panamyong, who nowadays maintains close affinities with the Chinese Communists. Secondly, Marshal Phibun's policy, aimed at supporting the United Nations and based on a shrewd interpretation of self-interest, is by no means universally popular in Siam, and if it looked like making the country run undue risks would itself be a leading factor in stimulating a *coup d'etat*; the Marshal came to power by a coup in November 1947, and several attempts have already been made against him. Thirdly, Marshal Phibun has to show his people a dividend for what he is doing; at present it consists of a flow of American arms, but if this slackened off or became less interesting the position might change very rapidly. Lastly, since Siam is a city-state whose political life is entirely dominated by what goes on in the capital, it is a matter for some concern that nearly half the population of Bangkok is Chinese. So far they have proved themselves hard and peaceful workers, with no interest in politics; but they occupy a powerful position in the Siamese economy and there is no knowing for certain what effect propaganda from the new China may gradually have on them. Unique, therefore, as an independent, stable, and actively anti-Communist state

in this troubled part of the world, Siam is nevertheless not to be trusted very far.

A great deal has been written and said about the position in Malaya, so that no more than a very brief summary need be given here. During the past year the emergency has entered a new phase in that the alarming decline in public security which took place in 1950 has at least been halted. A corner has been reached, even if it has not yet been turned. In terms of statistics, of the numbers of guerrillas killed and captured, of the reduction of the frequency of incidents, of the increase in information coming in to the police, and of the resettlement of squatters, progress is being made. For the planter, however, exposed day after day to violence and the chance of sudden death, a good deal more needs to be done before he can sense a real change in the atmosphere.

The factors making for improvement, apart from the blow to guerrilla morale and Communist prestige struck by China's failure to win in Korea, spring from the new if belated mood of resolution which came over the Government of the Federation of Malaya towards the end of last year. It was realised that, if the emergency merely went on the way it had so far been going, all normal life in the country would gradually grind to a standstill. People outside the Government put the matter more strongly; they saw the British losing Malaya altogether. Hence the Malayan Federal Government took powers to direct Labour, to conscript men for part-time service in the Home Guard, and to control building and other raw materials; redoubled its recruiting drive for the police; created a new department of psychological warfare; took steps to ensure that the first and most important stage of squatter resettlement under the Briggs Plan was completed to schedule in May 1951; created a more effective War Cabinet by bringing into it Malay, Chinese, and unofficial planter representatives; passed a law imposing collective fines on rebellious communities; cut down unnecessary government services; and last, but by no means least, held out the prospect of political development in the Federation by instituting municipal elections and by pressing ahead with the widening of Malayan citizenship under conditions accepted by the Communities Liaison Committee. The result is that with military pressure being maintained against the guerrillas there is a chance, though not more than that, of considerable improvement during the coming year. It is unlikely, however, that the emergency can be brought to either a sudden or a complete end in the early future.

The other two countries of the South-East Asian quintet, Indonesia and Burma, have it in common that they have each obtained effective sovereign independence from colonial rule since the war—and it should never be forgotten that Indonesia is equal in size to the whole of the rest of South-East Asia put together. In both, the new national governments have had a hard struggle to enforce their writ ever since they came to power—though this fact, inevitable as it was, should not be taken as a valid argument against their claims to independence having been accepted; their nationalist leaders, at the helm of movements which neither they nor anyone else could hold back, were in no position to accept anything else but independence. During the past year the Burmese government has recovered just a little of the ground it had previously lost to the Communist, Karen, and other insurgents—but not much. In Indonesia, on

the other hand, the situation has distinctly deteriorated. Early in 1951 thirty battalions of the Indonesian state forces were deployed in Java against guerrillas of the extreme Moslem movement of Dar-ul-Islam and against sundry Communist groups, a combined total estimated between 10,000 and 25,000 men, while elsewhere in the great archipelago revolts in Ambon and Celebes had barely been quelled. The Army and Police, numbering more than 300,000 men, cost over 35 per cent. of the budget, and yet is losing the battle.

The decline in the authority of the central government in Indonesia is indeed alarming. In the long run it opens up the possibility of quite as many dangers for the British in Malaya as the more obvious crisis in Indo-China. For Indonesia lies in Malaya's back yard, the Indonesians are of Malay race, and the strategic implications of having this vast area between the Pacific and Indian oceans go Communist would be serious. What are the chances? Three factors are important. First, the present leaders of Indonesia, whose prestige is high as a result of independence, genuinely do not want to join either of the world power blocs, neither the Russians nor ourselves, though they are accepting American aid. They are, however, in a cleft stick. On the one hand, many of them were educated in Europe and they are intellectually close to Western political concepts. On the other, they are afraid of the forces moving beneath them in their own country and dare not risk a close association with the Western powers. Secondly, an extremely adverse factor is the increasing hold of the Communists on the labour movement. They now control probably 75 per cent. of the labour force through the trade union federation usually known by its initials S.O.B.S.I. This is particularly strong among the plantation workers, on the railways, and in the docks, and in the oil, tin, and textile industries. Thirdly, however, there is a strong streak of Trotskyism among Indonesia's Communists. The true Stalinist movement received a blow from which it has still not recovered when its planned attempt to seize power was crushed at Madiun in September 1948 and several of its key leaders were killed. Hence the orthodox Communists have lately made little headway among the peasants, and it may be that in spite of some progress also made in Peking's efforts to proselytise Indonesia's 2,000,000 Chinese minority, Indonesia's immediate danger is more a drift towards chaos than a specific alignment with Peking and Moscow.

In Burma the people themselves only want to be left alone. Traditionally the Burmese have lived a secluded life, shut in between the sea and a great ring of mountains, with land rich enough to grow food in abundance, and only occasionally swept up in the main stream of history. This is what many of them would like to return to to-day. They do not mind their modern economy going to ruin, oil exports down to zero, mines closed, teak forests unworked, and only one-third of the rice for sale abroad that there was before the war. Nevertheless, Burma represents a special liability to the anti-Communist world. For one thing, the Chinese have long laid claim to sovereignty over northern Burma; if Peking were now to succeed in cashing in on this traditional claim and pushed troops from Yunnan down the war-time Burma road, this would give a great boost to Communist prestige throughout South-East Asia. For another thing, Burma's rice, like that of Siam, plays a vital role in helping to feed the neighbouring countries. If rice imports into Malaya

dropped much below the current annual figure of some 600,000 tons, genuine distress would play into the hands of the Communists. On the other hand, there is at present almost nothing the Western powers can do to protect Burma. The only method of intervening that might be reasonably realistic would be for India to do it. But neither Delhi nor Rangoon are at present in a mood to make that anything but difficult and indeed impossible.

Strategical considerations throughout the Indian Ocean must, in fact, depend to an unfortunately large extent on the attitude of India. Although the relations of the people of both India and Pakistan with the British have been good since the transfer of power—so good that they contribute one of the most remarkable tributes ever paid to British statesmanship—India's resources can no longer be expected to be thrown into a world struggle on the side of the Western powers. It is possible that they may, but they cannot be counted upon.

To take the case of Pakistan first, Karachi's attitude is at present dominated by the dispute with Delhi over Kashmir. The importance of this tragic and foolish business can scarcely be exaggerated. Pakistani statesmen say frankly that until it is settled, and settled at least to the minimum satisfaction of Pakistan, their country can play no part in the defence of the Commonwealth. This means, directly, that no contribution whatever is being made by the Indian sub-continent to the holding of the Middle East; Pakistan's voice is not even raised in Teheran, where it might have some influence over the wanton and sinister attack on the Anglo-Iranian Oil Company; nor are any Pakistani forces likely to be available for service in the Middle East in the event of war—in the last two wars troops from India played vital roles by striking into the Middle East from the Persian Gulf. And indirectly the Kashmir dispute holds the threat that, although Pakistan is at present profoundly anti-Communist, hot-headed nationalists may at any time invoke Russian aid to defeat India. Disastrous as this would be to all that Pakistan stands for, the fact that it is always possible was shown by the abortive plot of certain military leaders, headed by the Army Chief of Staff, to seize power last March. It is true that, in associating with Communist fellow travellers, the plotters were merely trying to exploit them; but the latter under Moscow's direction have a habit of turning the tables on anyone who is unwise enough to play them at their own game.

The scene in India is framed by four main factors—the clash with Pakistan, Mr. Nehru's foreign policy, the country's own Communist party, and India's economic weakness. The dispute over Kashmir does not, as in Pakistan's case, positively prevent India paying any attention to other external liabilities, though it naturally has a weakening effect. What determines India's possible co-operation at the moment in any Commonwealth or regional action against Communism is the neutralist trend of Delhi's foreign policy. This has been established personally by Mr. Nehru, who is Foreign Minister as well as Prime Minister. So long as he is in office India would not participate in a world war alongside the Commonwealth—at any rate in its early stages. This precludes the establishment of any satisfactory regional defence arrangements and must be recognised in any discussion of strategy in southern and eastern Asia. Fortunately, the chances of India's attitude changing are not too remote.

If the late Sardar Patel had had his way, for instance, India would long since have thrown in its lot against international Communism. But for the present Indian foreign policy must be reckoned a source of serious weakness in the Asian anti-Communist front.

The one remarkably encouraging factor in India itself is the somewhat surprising failure of the Indian Communist party to make any appreciable progress during the past year. This is partly due to the constant change of party line dictated from Moscow, especially in supporting, then opposing, then again supporting Mr. Nehru, and partly to the rift inside the party on the question of whether to use violence or to proceed by constitutional means. The Communist failure is also undoubtedly attributable in part to the tradition of democratic government left by the British. However, this year's appalling famine in Bihar, Madras, and other parts of India may well prove the beginning of a new Communist opportunity. Coming on top of the growing realisation in Delhi that such a heavily populated country and primitive economy as India's will find it enormously difficult to raise living standards without using totalitarian methods, the famine has gained much support for Mr. Nehru's often proclaimed view that, whatever happens, India cannot afford to go to war.

Neither South-East Asia, then, nor the Indian sub-continent at present offer much scope or promise for building up a strong co-ordinated defence against Communist aggression. This is a chastening fact which must be reckoned with, in spite of the many arguments which point to the need for denying this huge productive and strategic area to the Communist camp. At the same time, it would be wrong to despair of preventing the local Communists seizing power from within, powerful and dangerous as they potentially are. The die is not yet cast, even though the odds are unpleasantly in the Communist favour.

What of the Western Pacific? The effectiveness of its defence depends in many ways on what happens in South-East Asia and on the Indian sub-continent, just as their's is equally closely linked with the fate of the great island chain in the Pacific, from Japan down through Okinawa to Formosa, the Philippines, New Guinea, and Australia. But the most important single need in the Pacific is to prevent Japan falling under Communist control; if Japan went, South-East Asia would certainly be lost in the end, and probably India too. This struggle for Japan is only just beginning; indeed, its imminence and reality are scarcely yet recognised. At the moment, it is true that Japan is firm and safe, still dominated by the Occupation, still living in the military shadow of the United States, and still ruled by leaders of its own whose existence depends on keeping the Japanese Communist party out of power. But once the peace treaty has had time to take effect and Japan is on its own, the political battle inside the country may well begin to look very different from what it does now. The West's task will become even more urgent than it is now to find ways in which Japan can sell and buy abroad, without suffering chronic unemployment and without depending on China for a large part of its foreign trade, particularly as a supplier of raw materials. Up to the present, Britain and America have quarrelled over the implications of this economic need and there is so far no prospect of an effective solution.

Naturally the whole prospect of Pacific defence also depends on the

outcome of the war in Korea. If the United Nations can fight that to a successful draw it will act as a widespread damper on Communist ambition. If not, or if, through lack of resolve, the United Nations were to court disaster, Communism would receive an almost decisive fillip throughout eastern and southern Asia. But from the point of view of the free world, once the Korean war is settled, however that may come about, certain principles should be kept in mind in order to try to build a system of collective security in the Western Pacific and in southern Asia. First, any such system must involve both Western and Asian powers on an equal footing. At present the brunt of military action against Communist aggression necessarily falls on Western non-Asian powers, the Americans (mainly) in Korea, the French in Vietnam, and the British in Malaya. Yet this is dangerous to the success of the attempt to fight Communism in Asia if not wrapped up in political arrangements with which Asians are freely and voluntarily associated, since it makes the West look as if it is ganging up on Asia—though anything less like ganging up than the disjointed and discouragingly unco-ordinated policies of the three powers during the past year or two it would be hard to imagine. Secondly, the system must lead Asians to feel responsible for and prepared to assist in organising their own collective security. At present a beginning has been made on a Pacific pact by the American guarantee to Australia and New Zealand, as well as to the Philippines. This cautious beginning is right and proper; a wider Pacific pact is probably impossible at present, since the great argument against it is that any country on the mainland of South-East Asia which is not willing to come in—as several are not—invites attack. But the ideal may become easier to attain with time, and when it does both India and Pakistan should be included. Thirdly, efforts should meanwhile be made to find a formula which would associate Pacific security with the United Nations; UNO possesses a reputation and a prestige in Asian minds which belong to no individual power. Lastly, the proposed scheme for collective action should be designed so far as possible to provide for threats to internal security as well as for overt invasion. Although the aggression against South Korea was an invasion from outside, the war has been in many unpleasant ways a civil war, and, as Indo-China and Malaya further show, it is the internal security threat which is now the primary danger to be resisted all over southern and eastern Asia.

R. GOOLD-ADAMS

CHAPTER VI

THE KOREAN SCENE

THE WRITER first arrived in Korea in August 1950 to replace Mr. Ian Morrison of *The Times*, who was killed by a mine explosion. The period he spent in Korea included the last phase of the first retreat down the peninsula to the Taegu-Pusan bridgehead, the defence of that south-eastern narrow corner, the seaborne landings at Inchon and the break-out from the south, the capture of Seoul and Pyongyang and the leisurely advance to the Yalu river. The later phases—the retreat before the Chinese, the cautious advance back to the 38th Parallel in the wake of the withdrawing enemy, and the battle which was joined at the time of writing in April—were not witnessed.

The peninsula of Korea is an appendage of the Asian land mass. On both sides of the 38th Parallel which divided the new republics of North and South Korea it is an unfriendly land for the soldier, and difficult terrain for commanders and staff officers. From the Yalu to Pusan it is a corrugation of hills, the erosion of which crowded the population and its appurtenances into the valleys. Roads and railways, and accordingly most avenues of military movement, are found only in their bottoms, and are further confined by paddy fields to raised embankments dominated by the hills. There is little opportunity presented for tactical deployment of tanks and wheeled vehicles, or, for that matter, troops trained to depend upon them. The rivers generally have wide beds, which are almost dry during the hot months and are frozen in the winter. Their efficacy as defence lines or obstacles of advance is not decisive, and determined troops had little difficulty in crossing them. A road and rail system, fairly good by Asian standards, runs into Manchuria, thus militarily tying Korea more securely to the Asian land mass. Ports are few. To mount an offensive from Japanese bases proved expensive in men and effort; without those bases it would have been impossible. It is no wonder that the American Joint Chiefs of Staffs considered Korea to be indefensible by the West.

The climate is one of extremes which American and European troops—their elaborate equipment—find trying. In summer it is as hot as the Punjab, and the dust is irksome. Accidents due to collisions of vehicles in the dust clouds which hung over the roads like permanent palls were frequent. The autumn, the season in which the United Nations forces first advanced, is ideal for campaigning; cool, invigorating, but warm enough to permit troops to wear normal clothing. The winters are cruel. Snow and cold sweep down from Manchuria, blocking the roads, freezing the rivers, penetrating the thickest clothing, and introverting those who wear it until warmth and survival are their main preoccupations. Aggressiveness wears thin under these conditions and the stoutest troops become reluctant fighters.

The campaign arena was complicated politically. The peninsula was divided by a Communist regime and a government which purported

to be democratic. To accept the two republics by these labels was misleading. Above the 38th Parallel the government of Kin Il Sung was not dissimilar from the European satellites. It had had its purges, and morality and concepts of justice had been perverted to fit the Marxist doctrine. There the comparison should end, because it is important to remember that Asians generally do not reject Communism as do most Occidentals. Certainly the North Koreans did not. After fifty years of Japanese occupation the people had been conditioned to a rigid administration, and the Communist leaders appeared to enjoy a certain popularity or respect; probably because the nationalist spirit which had persisted in spite of the length of the occupation had been nurtured by them. They had played a prominent part in the fight against Japan before and during World War II, whereas the free Korean government of the South worked from comfortable headquarters in Washington. While Syngman Rhee played the part of an exiled democrat to an American audience, the Communists associated themselves and lived with the Korean peasants and industrial workers. The war, moreover, came when the development of Communism was still at a stage beneficial for many of its people. Land reform had been implemented, and thousands of peasants had their own fields for the first time. That they had to pay high taxes in the form of crops was unpopular, and sooner or later redistribution of land would have been followed by collectivisation. But in June many North Koreans must still have been grateful to the Communists.

Below the Parallel the scene was very different. The South Korean government had the forms of democracy, but it was autocratic and it had done little to alleviate the hard lot of the people. There had been talk of land reform, but much of the land formerly owned by the Japanese had passed into the hands of the big land-owners. A conservative reform bill was consistently blocked by the Government, and when it was enacted in May 1949 the President abrogated it and caused further delays until a special session of the National Assembly enacted it for a second time. The act had still not been fully implemented a year later, and had it been extended to North Korea, as Syngman Rhee intended after the fall of Pyongyang, it would have been resented as retrogressive by the peasants who had benefited from Communist legislation. Thus there was little reason for the South Korean peasant to fight the invader. The invader, after all, was a fellow-countryman. American and European troops may have regarded the United Nations decision to prevent Communist expansion by force as a war aim, but the atrocities carried out by South Korean troops and police in the name of democracy soon sickened most of them and produced a dangerous and unhealthy cynicism.

When the divisions of the North Korean Army moved across the Parallel in June there was little to prevent a speedy victory. The South Korean Army, trained by an American military advisory group, had been reduced to the status of a gendarmerie by the dispersion of many of its units throughout the country to quell lawlessness and discontent. The few units stationed along the frontier were taken by surprise. Many of the American military advisers later admitted that they had had only sufficient time to evacuate their families. Seoul fell within a few days, and the complete occupation of South Korea appeared to be inevitable until the United Nations intervened. Within a remarkably short time

the American 24th Infantry Division was dispatched from Japan. This division was to be the forerunner of a large United Nations Army, but in the critical days of July it was a lonely force of young and inexperienced troops. They had joined the Army for garrison duties in Japan, and they were soft and unready for battle. They were despatched hastily, as were their vehicles and equipment, and they were hardly a cohesive force when they advanced to the front. But at that time little was known of the enemy, and the division drove forward with confidence and some carelessness. It did amazingly well. Defences were attempted at river lines, and communication centres—notably Taejon—were fought for tenaciously. The Force suffered heavy casualties, and its commander, Major-General Dean, was reported missing.

Meanwhile the other three American divisions in Japan were either embarking for Pusan or preparing for service in the field. From San Francisco a United States Marine regimental combat team had set sail and the 1st Marine Division was being concentrated. American aircraft based on Japan had flown operational flights over Korea since the day of the United Nations decision. Squadrons had been moved forward to Pohang, Taegu, and Pusan. Other squadrons, including Australian, British, and Canadian, were arriving. American, British, and Commonwealth naval craft were standing off the coast of Korea, and other units were steaming to join them. More important, the logistical machine of the American armed forces was preparing to supply and support the concentrating forces.

It was a magnificent demonstration of efficiency and encouraging evidence of Western unity; nevertheless, the North Korean forces continued to advance. Other formations joined the 24th Division, but only to retreat down the roads along which they had so recently advanced. The Tactical Air Force flew constantly, and claimed to have destroyed thousands of the enemy's troops. Four-engined bombers, notably the B.17, dropped hundreds of tons of bombs on the conventional military targets, but still the North Korean advance continued. By the end of July the American and South Korean forces had fallen back upon the Nakdong river, considered to be the last natural defence line in Korea. The invading forces had advanced beyond the limit of their supply and the increasing strength of the defenders had been concentrated into a small area. The first phase of the campaign had ended.

Little opportunity was given to the defenders to consolidate. Although it was obvious that the enemy was re-forming its divisions, and moving up reinforcements and supplies, its front-line troops continued to harry the United Nations positions all along the line. Nevertheless, the United Nations forces achieved some kind of reorganisation and dug in to hold the enemy until such time as a counter-attack could be mounted. Perhaps the most notable achievement of this period was the re-emergence of the South Korean Army as a fighting force. Tens of thousands of men and boys were conscripted and after a few days' training sent to the new divisions. Compared to the American forces, their equipment was primitive, but every man was given a rifle or a carbine, and a few machine-guns were found for the battalions. These new divisions, five in number, were given the responsibility of holding the northern sector. This stretched from Pohang on the east coast westward to the Nakdong. Here

the north-west bastion was held by the American 1st Cavalry Division. The Naktong line was held by American formations including one Negro regimental combat team. In early September the British Commonwealth 27th Brigade took over positions just south of those of the 1st Cavalry Division. Because of the preparations for the Inchon landing there were few reinforcements available. Fresh drafts were sufficient only to fill some of the gaps caused by constant casualties incurred during the skirmishes. Some American formations had to absorb South Korean troops. There were few reserves—one regimental combat team at the most—and units which were supposed to be resting were often rushed from one part of the perimeter to another to support hard-pressed battalions.

In the last week of August the North Koreans began an offensive which according to their radio propaganda would sweep the United Nations forces into the sea. It was mounted against the South Korean positions in the north and the American 1st Cavalry Division on their left. Within a few hours they effected break-throughs in the centre of the northern sector and cut the lateral road to Pohang. Simultaneously they advanced down the Tabu Dong road to within seven or eight miles of Taegu. This road runs along the bottom of a narrow valley dominated by hills high enough to confine even the attacking forces. American fighter aircraft based on a strip only a few miles from the front flew sortie after sortie and held the attackers just north of Taegu. American casualties were heavy, but the Taegu bastion was held. To the east, however, enemy pressure was too much for the South Koreans and in spite of the arrival of a hurriedly organised American task force, and Naval shelling, Pohang with its airfield fell.

Other attacks were made along the western sector, but although the Naktong was crossed here and there the line held, and the 24th Division was withdrawn from its positions to participate in a counter-attack planned to coincide with the landing in the north. This counter-attack was courageously conceived. Although the staffs of the two South Korean corps deployed on the right had little information of the exact positions, strength, and condition of their units, Eighth Army planned to send this ill-starred division across the river to seize and hold the road to the north along which the general advance would be made when the Inchon landing was completed. On September 14 the United States 1st Marine Division landed at Inchon and the counter-attack was launched. It was a precarious operation. The point chosen for the river crossing—north-west of Taegu—was served by one narrow track. Down this track poured the hundreds of vehicles which belong to an American infantry division. They had to be ferried across a fast-running tributary, and then leaguered in an area hardly suitable for the comparatively few vehicles of a British infantry brigade. Chaos reigned. The road was clogged with vehicles, and the infantry had to flounder in the ditches to reach their assembly areas. It took the writer about eight hours to traverse a few miles of the road. The assault craft, without which the attack could not have been mounted, were on trucks somewhere in the rear of the column, and less than two hours before dawn the commander of the leading regiment did not know whether his troops would be ready for the attack. Somehow a few assault craft were carried to the river's edge, and in the bright dawn hour the first wave paddled across.

They were unopposed, but the following waves had to brave the belated automatic and mortar fire from the North Korean positions. By midday two battalions were safely across, and by nightfall Waegan had been captured and the advance north begun.

This breakout was a victory as significant if not so spectacular as the successful landing at Inchon, and it provided a very definite conclusion to the first part of the Korean war. For the purpose of this article it also provided an opportunity to review aspects of the campaign and the character and composition of the contending forces. First, the North Korean Army. At the beginning of the campaign this Army had the benefit of surprise and military preparedness, but it is important to remember that within a few weeks the immediate decision of the United Nations to meet force with force had been followed by the despatch of an expeditionary force. Four American divisions—under strength but supported by independent regimental combat teams, or brigade groups—took up positions along the United Nations perimeter. Two South Korean army corps were raised and maintained, and a British Commonwealth brigade was committed. The initial numerical superiority of the enemy was thus diminished. Probably the strengths of the two Armies were equal. The American 5th Air Force and Australian aircraft were free to fly anywhere above Korea. After the first few days, when the small North Korean Air Force of elderly Yak fighters were destroyed, there was no opposition or anti-aircraft fire. The United Nations Fleets ruled the waves. Yet against this impressive array the initiative remained with the North Korean forces until the Inchon landing, and Taegu, without which the stretched United Nations line would have collapsed like severed piece of elastic, was only just held.

The reasons for the success of the North Korean Army were many, but the calibre of its infantry was probably the most important. Little is known of these simple, patient men, but much can be learned of the North Korean rank and file from that of the Southern Army. Physically and mentally the two were the same. They were a physically strong people, often politically naïve or malleable in spite of their long struggle for political independence. Their submission to a political regime appeared to depend upon geographical location. If they lived in the area controlled by the South Korean government they fought for the United Nations cause. If they were from the North or the overrun provinces they fought equally well for the Communist government. The military training received on both sides was inadequate by American or European standards, but again there were certain similarities. In both Armies they were given elementary training in small arms or light automatic weapons. Their natural submission apparently replaced discipline effectively enough.

But the fact that the enemy troops were identical with those of two of the United Nations army corps—many of their reinforcements were also South Koreans—indicated that there were other factors contributing to the early successes. These can be explained only by the North Korean use of factors which did not exist, or were not adequately exploited, in the South. These were occasionally political, but for the most part were concerned with command or tactics. Every North Korean unit had an attached political commissar, or cultural officer as he was called. Apparently the lessons of the Spanish Civil War had been remembered,

because these officers had little authority in military affairs. These were left to the soldiers, and the cultural officers concerned themselves only with political education and Communist indoctrination. Evidently this was successful. Among prisoners taken were a sizable minority of Communists, or men indoctrinated with Communist principles and aspirations. One American officer of the military advisory group attached to the South Korean Army estimated that about one-third of the prisoners captured by this Army were Communists. The writer talked with one prisoner who before the war had been a student in a Methodist school. He spoke English well, and had studied law. He had had friendships with American missionaries and was not ignorant of the Western way of life. Yet in spite of this background he had become a Communist: a party member well versed in dialectics and burning with a fanaticism rarely seen since the Middle Ages. Men such as he had a single-mindedness and sense of purpose which proved an inestimable source of strength on the bare, cold hillsides many miles from Army or party headquarters.

The North Korean command was surprisingly efficient. Strategic and tactical mistakes were made, but until the end the course of the campaign showed that it had a confident grasp of conventional military principles. Many of the commanders had fought with the Chinese Communist 8th Route Army, and others had attended Russian military academies. They guaranteed competent command but had few surprises for the United Nation's forces. In fact, in retrospect the North Korean invasion was noteworthy because of its development along classical lines. After the initial surprise, unexpected actions of the enemy were, and could only be, on a tactical level. They had insufficient forces and material to attempt, for instance, an amphibious landing anywhere behind the United Nations perimeter. Fifth column activity was the only surprise weapon they could have used, and there was little of this. Stories of enemy forces filtering through United Nations positions with refugee columns to join with concentrations of troops forming slowly behind some hill range were largely untrue. Refugees could not pass through the front lines, and guerrilla activity was limited to sniping. Had a civil revolt been engineered in Taegu during the critical period the issue would have been decided in favour of the enemy. Snipers who had infiltrated across the hills were, however, a dangerous nuisance. Most of the time United Nations transport and troops on the march were silhouetted against the sky, because many of the roads were raised above the paddy fields, and snipers claimed casualties and sometimes caused confusion. On one occasion the writer was with a battalion headquarters group on the Tabu Dong road. The headquarters had not been dug in and instead was scattered haphazardly about the road. Its companies were fighting hard on the hill range in front, and success depended largely upon good liaison, supplied by the headquarters, with flights of strafing aircraft. Suddenly the area was made uncomfortable by sniping; there were no slit-trenches, and, taken unawares, the headquarters panicked and withdrew, leaving the companies still engaged.

Tactically and logistically, the enemy conformed to the limitations of his forces and the nature of the terrain, and thus guaranteed a certain advantage. American troops, except for the Marines, were reluctant to dismount from their transport, and this from necessity confined most of

their movement to roads and valleys. The outcome was that small mobile enemy groups were able to move across the many hill ranges, and they frequently achieved tactical surprise. Academically this was inadmissible, but nevertheless inevitable, when one contending force permitted the limitations of mechanisation to shape its tactical purpose. For the rifleman in forward positions this constant penetration to the flanks and rear explained many of the withdrawals of the United Nations forces.

To sum up, the enemy's remarkable initial success can be explained, first, by the presence at headquarters of officers competent enough to direct the ill-trained and badly supplied rank and file into an aggressive pattern. Secondly, in the ranks were a mass of obedient peasants, strengthened by a high proportion of Communists, who may have believed or hoped that a Communist victory would bring them some reward, and whose physical strength and material poverty prepared them for the stern life they led in the hills. At the moment of attack mass hysteria engendered by xenophobia or political hatred replaced at times the determination which generally is the product of careful training and discipline. Organisation at all levels was pliable, and from necessity much was left to the decision of battalion and company commanders.

The system had obvious disadvantages. The time taken to prepare for an attack was long, re-grouping afterwards took even longer, and exploitation of successes became increasingly rare as the United Nations forces stiffened their opposition. But after more than two months of fighting it was still successful, and on more than one occasion it looked as if the United Nations forces would be thrown into the sea. Even after the Inchon landing, when defeat of the invaders became inevitable, the North Korean command continued to function effectively. In spite of what should have been a fatal deficiency of air cover, wheeled transport, wireless communication, and formal organisation, it maintained some kind of control over its formations, and ordered them to temporary safety behind the 38th Parallel. The fact remains that the enemy engaged nearly ten United Nations divisions, including four American divisions plus regimental combat teams, on the south-east front, and then disengaged when three other American divisions were deposited across its lines of communication. That it fought so well with so little sobered the rejoicings of many who entered Seoul after three months of desperate fighting.

Opposed to this Infantry Army were American divisions, well fed and well supplied and with a wealth of material which any British commander in World War II would have envied. It was, however, a force suffering from the effects of the post-war American reaction, a formation weakened by lax discipline, and a band of men softened by garrison duty in Japan and lack of basic military training. The implementation of the recommendations of the Doolittle Commission had deprived unit commanders of much of their power to punish insubordination. Other efforts to "democratise" the Army had further weakened its fibre. Apart from the United States Marines, the writer did not once witness immediate obedience in American units. Numerous memories come to mind, but one will suffice as an example. A company of American Infantry was entering a town, its squads dangerously bunched. The leading platoon commander ordered his men to spread out, but there was no response. He repeated the order twice, and still the men clung together. Eventually

he cried petulantly, "If you get killed it will be your own responsibility." Many, unfortunately, were killed unnecessarily on that day, and on others.

Lack of basic training was evident in most divisions. Troops rarely dug in, never put up wire, and only occasionally were offensive patrols sent out. There was little or no fire control, apparently because the supply machine worked so incredibly well. As a consequence, platoon and company positions were continually overrun. Lack of discipline was most evident at night, the time when the North Koreans generally attacked. There appeared to be no regimental spirit, probably because of the impersonal replacement system and the American habit of numbering units instead of giving them some territorial association. That the regimental spirit is a very tangible military factor and is also welcomed by the men were proved in some instances. The 1st Cavalry Division, although fighting in an infantry role, was proud of its cavalry past, and one of its regiments which called itself "Garry Owen's Own" was nearly as exclusive as an Indian cavalry regiment. The British Commonwealth 27th Brigade was the envy of many simple American soldiers because of its cap badges, the kilt, the Australian digger hat, and the intense regimental pride.

Physically the American soldier was unprepared for war. Life in the barracks of Japan had been too luxurious, and apparently no effort had been made to toughen them by route marches, battle courses, drill, and games. Only in the Commonwealth rear areas were men to be seen playing football. The American Army's reliance and belief in machines remained. Machines performed marvels, but they made the soldier dependent upon them. Three times a day the foot soldier in forward positions consumed fruit juices, chicken, candy, hamburgers, coffee, baked beans, and other delicacies. But he complained because there was no ice-cream available. He had a wardrobe which was confusingly munificent, but the roads were choked with the trucks which carried it. In the PX—post exchange or canteen—he could buy coca cola or beer by the case and a variety of consumer goods which would have overwhelmed the British housewife. Within a few miles of the front there were cinemas and ice factories, and the cold loneliness of death was disguised by service "morticians." Nearly everything that he may have wanted was supplied, except books. Instead, each unit was inundated with comic magazines. The only English-language books the writer saw in Korea were "Penguins" brought from Hongkong by the 27th Brigade.

Few new weapons were used, and the small arms, artillery, and most of the vehicles were of World War II vintage. Most of the tanks were Shermans—albeit with improved suspension—and the few new tanks which made their first appearances in Korea did not prove to be markedly superior to the opposing Russian-made tanks. Some equipment, tried and proved before 1945, failed to reappear, and generally only the older types of aircraft were suitable for the task presented. The Bailey bridge was not seen until the United States Marines brought in a few units. The armoured half-truck, one of the best patrol vehicles and troop-carriers ever built, was rarely seen except as a transport for light anti-aircraft guns. The omnibus jeep was again expected to play a ubiquitous role, and once again it was made evident that it cannot displace the foot patrol. American transport, however, was excellent, and General Sir

John Harding was particularly impressed by the six-by-six general-purpose truck. Compared to it the British four-by-fours were like lame ducks. The American gun tractor performed impossible tasks, dragging 105-mm. and 155-mm. guns and howitzers into positions which normally would demand hours at the guns' ropes.

The high standard of American mechanical equipment, however, appeared to contribute to the acceptance of a new philosophy which was enervating. It was summed up by one senior officer who said that there was not a single objective in Korea "worth the life of an American boy," and that it was better to expend "millions of dollars of material rather than expose unnecessarily sons and husbands." This sentimentality, and the resulting resentment against being compelled to fight in mud and on the hillsides in the pre-machine-age manner, was reflected in many ways apart from the deficiencies of the foot soldier. Artillery barrages, aerial strafing, heavy bombing, and naval bombardments were used—often ineffectively—for purposes which previously demanded only Infantry action supported by brigade arms.

This new philosophy was, in fact, the summation of all the loose thinking which has troubled military commanders since the first automatic weapon was invented, and the Korean campaign was therefore all the more interesting in that it provided an opportunity to test its efficacy against a conventional Infantry Army. The first three months of the campaign appeared to prove that there is still no substitute for a force founded on discipline, physical fitness, training, and determination. For instance, the American 1st Cavalry Division was ordered to seize two hill masses dominating the Taegu-Waegwan road prior to the break-out. It was estimated that the hills, which were bare and about 500 feet high, were held by two companies of Infantry. The American commander had one regiment—three battalions—and all the assistance he could ask for from the supporting arms. The attack was opened by a bombing raid. A squadron of B.17s dropped 400 tons of bombs on the two companies sheltering in slit trenches. The divisional artillery "stonked" the area for many hours. Divisional tanks and low-flying fighter aircraft gave close support. Smoke-screens were efficiently laid. Yet the enemy Infantry survived to throw back again and again the American battalions. The hill masses were eventually taken, but, according to a regimental staff officer, American Infantry casualties exceeded 200.

Apart from this and similar sad consequences of the misuse of supporting arms, the scope and efficiency of American machines were superbly demonstrated. The build-up of supplies and men would have been impossible without the size and efficiency of the American logistical command. The American performance in Korea should prove to the most sceptical that the 10-knot freighter no longer sets the pace of modern war, at least not for the United States. Their magnificent organisation was based on an economy of wealth and calculated waste. Unlimited resources made the creation of the logistical command possible, but they did not entirely explain its efficiency. Its close-knit organisation, communications with such refinements as mobile teleprinters, and a detailed knowledge of the capabilities of every component contributed, but perhaps the most important factor was the ruthlessness of the command. Everything, it seemed, was expendable. To witness the manifestations of its

efficiency became humdrum; the constant departure of transport aircraft from airfields in Japan and their lumbering arrival in Korea between the take-off of fighter and intruder aircraft were no more exciting than a London underground station during the rush hour. In fact, there was a great deal less unnecessary bustle.

This clockwork regularity, however, was attained only by an acceptance of losses. While regimental commanders were loth to expose their men to the dangers of bayonet charges, expensive aircraft—and their crews—were expected to fly under conditions which any other Air Force would have considered impossible. Aircraft crashed because they were overloaded or insufficiently maintained or because of pilot fatigue. Others only just reached their destinations by jettisoning the load. The writer saw one troop-carrier plunge into the sea immediately after take-off, but the long line of waiting aircraft departed on schedule, flying over the heavily equipped soldiers struggling in the sea. Personal courage and fortitude as well as technical ability were part of the make-up of logistical command. Undoubtedly the most notable American contribution to the United Nations effort in Korea was this guarantee of logistical supremacy. Other nations could have replaced its troops in the field but never have imitated its supply system.

The Inchon landing was also part of a superbly executed operation which only the United States could have carried out in the time available. Its strategic conception was not unduly remarkable, in that there were few alternatives, but the direction of the landings, made difficult by the tides, would have been impossible without American efficiency. Units of the Royal Navy participated in the preliminary bombardment, and a few members of the Royal Marine Commandos were landed, but otherwise the operation was entirely American. After the cautious and sometimes fumbling operations in the south, it was exhilarating to watch. It was a splendid reminder of the resilience of the American war potential and the strategic advantages of industrial superiority, but these were only successfully exploited because of the Marine independence of vehicles and heavy supporting fire. The Marines had a discipline created before the days of mechanised warfare.

The United States 1st Marine Division was similar to the best British Infantry divisions the writer had seen in action elsewhere. Its men were well trained and physically toughened, its N.C.Os. were hard, and its officers looked like officers. They wore their badges of rank proudly, and the men reacted accordingly. Its regimental spirit was tangible. Every member wore the corps' insignia, and they affected the obsolescent American gaiters to show that they were Marines and not soldiers. Their transport was no more numerous than that of a British formation, and marching was still considered the normal means of movement. Staffs were reduced to a minimum, as were rations and comforts. As a result, the division quickly seized Kimpo airfield and thus assured its aerial lines of supply, crossed the Han river, and was soon in the suburbs of Seoul. Here again the difference between the Marine corps and the American Army was evident. Instead of calling for saturation bombing and massed artillery, the Marines attempted to take the objective without destroying it. The capital was fiercely defended. The enemy commanders had the double objective of holding the city and keeping open the roads to the

north for the divisions escaping from the advancing Eighth Army. For six days a series of small but expensive street and house-to-house engagements were fought. Assisted only by their own support weapons and a few tanks, the division fought its way to the centre of the city. The Marine commander hoped to take Seoul with as little destruction as possible, but it was not to be. The sprawling capital of nearly one million inhabitants swallowed up the division. The larger enemy forces continued to fight desperately, and they had the advantage of holding Namsam, a hill dominating the city. It was decided to use close air support. Marine fighter and intruder aircraft, working in close co-operation with the Infantry, dive-bombed and strafed enemy positions sometimes only fifty yards in front of their own advanced units. The writer watched the bombardment from the forward battalion headquarters. It was an impressive display of efficiency, and a terrible thing to watch. Within a few hours the heart of the city was destroyed, and the following night the city fell.

Meanwhile the Eighth Army was moving northwards as rapidly as possible, and just before the city fell reconnaissance units joined up at Suwon, a few miles south of Seoul. South Korea had been liberated and, according to the claims of G.H.Q. in Tokyo, the North Korean Army had been destroyed. The decision to cross the 38th Parallel was made—at least by inference—and the advance to Pyongyang begun. The 1st Marine Division was withdrawn, and led by the 1st Cavalry Division the Army cautiously moved northwards. There was little or no opposition, and the speed of advance was governed by the desire to avoid casualties. Probably there was little more than three or four enemy battalions deployed before Pyongyang, and the North Korean capital fell more or less undefended.

The easy capture of Pyongyang was taken to be final evidence of the complete collapse of the North Korean Army. In Tokyo plans were made to withdraw many of the American troops and to hold a victory parade on Thanksgiving Day. The war, it was proclaimed, was over, and apparently it was not thought necessary to pursue closely the retreating enemy, nor to man quickly the northern frontier. Subsequent operations were more of the nature of military exercises. A paratroop regiment was dropped to "cut off the retreating enemy," but the 3,000 men were landed about twenty miles behind the advancing ground troops and only a few stragglers were captured. The 1st Marine Division, which was at sea off the east coast, dawdled for a number of days while the South Koreans cleared the port of Wonson, and advanced about seventy miles to the north. It was all very leisurely and dangerous.

The United Nations forces were divided, with only a very thin screen of South Koreans in the centre. On the west coast was the Eighth Army, and on the east the Tenth Corps, which since its arrival in Korea had had a command separate from the Eighth Army. These twin divisions were not the only weaknesses. General MacArthur had assured Mr. Truman, when they met on Wake Island, that the Chinese Army would not intervene—in spite of warnings from the Indian Ambassador to Peking—and that if they did only 50,000 troops could cross the Yalu River. The writer was similarly assured by American intelligence officers.

Towards the end of November the Chinese Fourth Field Army crossed

the Yalu. Almost without pause, its troops broke through the South Koreans in the centre, and outflanked the American and Allied forces. There was little fighting. General Lin Piao planned a campaign of manoeuvre, and it was carried out with amazing success although his troops had little or no transport. The vehicles of the United Nations forces served only to facilitate their retreat. By December 4 Pyongyang had fallen, and Seoul changed hands for a third time after the failure of a counter-offensive which General MacArthur said would end the war by Christmas. Meanwhile, American intelligence, which had failed to give warning of Chinese intervention, suddenly became amazingly specific. It claimed that there were 450,000 Chinese troops in Korea and 1,350,000 in Manchuria. From the field came reports of "hordes of fanatical troops." Always there were hordes, until war correspondents who observed some of the actions asked how many hordes there were to a platoon.

Obviously, these intelligence statements bore small resemblance to the facts, and it must be assumed that they were issued as a balm to wounded pride, as an excuse for inefficiency. The Chinese "volunteers" were soon identified as belonging to the Fourth Field Army, which according to reliable estimates had a strength of about 450,000 men. Of these, about 250,000 were committed in Korea at the time of the invasion. North Korean strength was probably between 50,000 and 100,000. Against this force the United Nations command had about 275,000 combat troops. A comparison of these figures makes absurd the alarming reports of "hordes," although the Chinese command obviously assured local superiority before attacking; and the observer is again left wondering at the United Nations defeat. At the time of writing the Chinese had yet to use aircraft against the United Nations ground forces, although duels had been fought by flights of fighters. The United Nations command still had its overwhelming air superiority, and its Fleets still stood off the coasts to harry where they could.

The Chinese offensive stopped in the middle of February. It had swept the United Nations forces out of North Korea, and far to the south of Seoul. Why it stopped is not known. Obviously, it had to be halted in order to permit its supply system to be moved forwards and to rest its troops, but its subsequent retreat before the cautious counter-attacks suggests that there was another, and probably political, reason. Seoul was given up without a fight, and the last formations recrossed the 38th Parallel. The situation had been restored: North Korea remained in the hands of the Communists, and South Korea was still in the Western camp. It has been suggested that the Chinese had thus gained their objective and were content. But no time was allowed to test this appreciation, and the United Nations Army, led by Lieutenant-General Matthew Ridgeway, who had replaced Lieutenant-General Walton Walker after the latter's death in a traffic accident, once more edged over the frontier. Again the Chinese reacted and at the time of writing they had forced the United Nations' forces back again into South Korea and were still fighting strongly.

Here the account of the campaign must perforce end. The war remains undecided, but whatever the outcome there are many lessons to be learned. Of those that the writer comprehended, the most important was that there is no substitute for discipline, training, and the old military

virtues. War cannot be made easy, and in the last analysis it is reduced to a man with a rifle and bayonet. If that man, whether he be American or Chinese, a peasant or a public schoolboy, is expected to advance into fire, hold position in the most trying weather, and accept the inevitable physical privations of campaigning, he must be strengthened by the old virtues. This every sergeant-major knows, but it did appear that in Korea too much reliance was placed on machines and supporting arms to the detriment of the character of the foot soldier. Aircraft and artillery, however, still remain supporting arms.

Secondly, attack by manœuvre can be confounded by determined defence. Fighter aircraft and bombers may not be able to stop an attack, but transport aircraft can lift lines of communication above the reach of penetrating columns. This contention was proved again and again in Burma during World War II by the British and Indian Armies. The Japanese failed to defeat them although they had cut the lines of communication because the transport commands of the Royal Air Force and the American Army Air Force delivered the goods. In Korea there were many more aircraft and good airfields, but no attempt was made to make a determined stand in the north.

Thirdly, the necessity of having a supreme command remains. In Korea the division of command and responsibility had disastrous consequences. It was believed that G.H.Q., Tokyo—which could be compared to Cairo during the desert campaigns—was loth to transfer all responsibility to the Eighth Army, and that it thus created a separate command for the Tenth Corps, which landed at Inchon, with its commander responsible to it. The results were sometimes fantastic, and finally tragic. On one occasion, soon after the Seoul victory in September, the spokesman of the Eighth Army announced that patrols had been sent out to make contact with the Tenth Corps, and that although physical contact had been made nothing was learned of its actions and intentions. Thus for weeks two commands worked not only independently of each other but also ignorant of each other's progress. The culminating tragedy came when the Tenth Corps was completely divorced from the Eighth Army, and deployed on the east coast, with a gap between them through which the Chinese marched.

Fourthly, the acceptance of the limitations of air power. In Korea the consequence of the new philosophy of fighting a war "safely" was the use of aircraft on tasks for which they were never intended. The American Air Force did sterling work against targets such as bridges and railways, but its attempts to destroy the enemy by bombing were signal failures. Saturation bombing of company areas again proved to be more or less useless, and dependence upon it blunted the aggressiveness of their own troops. The need for close co-operation between air and ground, when aircraft can be used tactically, must again be reiterated. That which existed between the United States Marines and their own aircraft was excellent. When the writer was with Marine formations he was invariably impressed—and terrified—by the nearness of their close support. Again and again Marine aircraft strafed about fifty yards or so ahead of their own troops. Such efficiency was not evident elsewhere, and frequently strafing aircraft were too far ahead and too precipitate.

Fifthly, the political consequences of war. From the very beginning

United Nations intervention was more of a continuation of the struggle between the East and the West than a defence of South Korea. Certainly psychologically the war was fought without regard for the South Koreans, and their unfortunate country was regarded as an arena rather than as a country to be liberated. As a consequence, fighting was quite ruthless, and it is no exaggeration to state that South Korea no longer exists as a country. Its towns have been destroyed, much of its means of livelihood eradicated, and its people reduced to a sullen mass dependent upon charity and exposed to subversive influences. When the war ends no gratitude can be expected from the South Koreans, but it is to be hoped that the lesson will have been learned that it is worse than useless to destroy to liberate. Certainly, western Europe would never accept such a "liberation."

It might be profitable to attempt here a comparison between the American contribution and Russian aid to North Korea. To confine it to weapons and equipment would be impossible. No Russian transport aircraft were seen and only a few fighters made an appearance. Russian wheeled transport was confined mainly to a few light cars, and tanks and artillery were also comparatively few, yet Russian aid was not inconsiderable. Apart from its ideological export, which was an adequate substitute for many more tangible commodities, its main contribution was made in small arms, light automatic weapons, and ammunition. These included few new weapons, although in the field of artillery shells there were two interesting innovations. The cheapness of manufacture, however, was important and by inference disturbing. It was natural enough for American soldiers armed with the beautifully made M1 (one) rifles to sneer, but the acceptance of shoddy workmanship increases Russian production. The wide use of pressed metal components by Russian ordnance designers reduces the number of machining operations, as does the simplicity of design. The finished gun may be a little dangerous to handle—probably a number of North Koreans and Chinese accidentally shot themselves—but it can be argued that there are many Asians and apparently many Russian cheaply made weapons. There is nothing new in this manufacture of cheap weapons. The Sten gun was probably the prototype. Only the logical application and the possibility of manufacturing large quantities of comparatively backward countries such as China are significant.

As suppliers of an ideology the Russians compared favourably with the United Nations forces. The attitude of the latter was at least open to criticism. The wonder of the armed forces of the United Nations fighting under the blue and white flag of international conscience remains, but few attempts were made to explain to the American soldier why he was fighting. Publications similar to those of the British Army bureau of current affairs were naïve to the extreme. The national hatred and fear of Communism was sufficient in most cases to inflame him with a rather indiscriminate belligerence which often showed itself in an ugly way, especially in the treatment of prisoners of war, who had to suffer the indignity of being stripped naked. It failed, however, to bring about any kind of sympathy for South Koreans, except, of course, in the thousand and one little kindnesses troops offer to children and lost dogs.

Obviously the American soldier welcomed the arrival of British troops,

which had a psychological effect far greater than their numbers warranted. The South Korean, unfortunately, was regarded as a "gook," like his cousins north of the 38th Parallel. He was distrusted and often believed to be a former or potential member of the enemy's forces. "Gookism" is a disease which will almost certainly strike at American troops again should they be committed to another war or police action in Asia. "Gook" is an ugly word; it infers no grudging respect as did the appellation "Jerry." It is the product not only of distrust and national insularity but of fear—fear of the unknown, fear of a vague awareness of hundreds of millions of Orientals unimpressed by their material wealth, fear of a threat to the extraordinary luxury of American barracks.

The wealth of his equipment and the variety of his food, clothing, and entertainment not only impeded the American soldier's movements; it also divided him from the local troops and imprisoned him in a materially rich world out of which it was difficult to escape. The private soldier, with his basic pay of \$80 a month and his guaranteed supply of consumer goods, was like a wealthy tourist protected from the difficulties of foreign travel. Not only was it difficult for him to accept the strange hills as a natural habitation for infantrymen when in the vehicles below there were so many intimate reminders of home, but to make some personal contact with the Korean conscript was impossible. Unavoidable as the disparity between the standards of living of the two may be, no real attempt was made to bridge the gap with understanding. Friendships between South Koreans and American officers attached to the military advisory group existed, but although many of these officers had spent years in Korea few had bothered to learn the language.

Much time must elapse before all the lessons of the Korean war are clearly seen, but there are two more points which became evident. The American war potential became actual very quickly because of its huge bases in Japan. In other words, the production line and the machine tools were ready. The importance of Japan as a base, or as an ally of the West in Asia, has been proved. Opposed to this costly mass of military installations and intricate organisation, the Communist-led Asiatic peoples have man-power which when armed with the most simple and cheaply made weapons becomes a formidable foe. Perhaps it is impossible for Russia to copy the American logistical command, or to hope to equal its industrial output, but there is no reason why the member nations of the United Nations should not attempt to understand and gain the co-operation of the Asiatic masses. Certainly no attempt was made in Korea.

LOUIS HEREN

CHAPTER VII

THE INFLUENCE OF SCIENCE ON STRATEGY

MOST PEOPLE think of the application of science to war in terms of new weapons, such as the submarine, the tank, or the atomic bomb. But improved weapons do not necessarily affect strategy. The strategy of the last war in Europe was closely similar to that of the Napoleonic wars. Hitler had much the same aims as Napoleon; he had the same brilliant successes, and made even worse mistakes. He under-estimated the real strength of his enemies, failed to control the seas, and was gradually worn down and finally defeated on land. But though strategy had altered so little in 150 years, weapons had changed out of all recognition.

It is, of course, impossible to draw a sharp distinction between strategy and tactics. The one merges insensibly into the other. The improvement of familiar weapons, such as the gun, may be said to be of tactical importance only. Broadly speaking, tactical success depends on the deliberate application of science to obvious military needs. But radar, for example, never was a "military requirement" until its uses had been made manifest by scientists. It could not have been invented if pure research had been neglected. It was, and is, invaluable as a new method of reconnaissance; and as such it revolutionised tactics. But it was also of great strategic importance in the sense that without it (and without "asdics"), the fundamental strategy of preserving sea communication would have failed.

A striking example of a similar influence of science on strategy can be taken from the field of medicine. Throughout history the greatest danger to armies in the field has often been the attack of insects and bacteria rather than the action of the enemy. When Japan cut off the supplies of quinine to the Allies, she dealt a blow the effect of which is perhaps even now insufficiently realised except by those on whom it fell directly. The Burma campaign would have utterly failed unless a substitute drug had been discovered just in time. It is hardly less true to say that the success of the campaign in the Pacific depended on the wholesale use of insecticides as well as on anti-malarial drugs. The revolutionary advances in medicine and surgery during the present century have indeed had a profound influence on strategy. The last war was the first in history of which it can be said that the armies of the most advanced nations suffered fewer casualties from disease than in battle, and in which a high proportion of wounded men were restored to full activity in a short time. It was the first in which large forces could be deployed under the most adverse conditions without serious losses from natural causes. All this came about through the normal progress of science uninfluenced by the prospect of war. There is much to be learnt yet in the application of medical science to war. Germany's strategic defeat in Russia, for example, was largely due to the failure to maintain health and morale under the bitter conditions of a Russian winter.

In only one respect has the advance of science and technology introduced an entirely new element of strategy. This is the strategy of attacking the centres of industry far within the borders of enemy country without occupying them, or even intending to occupy them. This strategy was only made possible by the invention of aircraft; and as flying would have been impossible without the development of light power plants it may be said that of all advances in science or technology within living memory the invention of internal combustion engines has had the greatest effect on strategy as well as on tactics.

Whether this strategy achieved its aim in the last war is a controversial question which will perhaps never be settled to the satisfaction of all students of war. There is clear evidence that the immediate weight of air attack on Germany did not prevent her from increasing the production of war material right up to the last year of the war; and the main cause of its final catastrophic decline was that the attack was concentrated on oil and communications. On the other hand, it is equally clear that Germany was forced by Allied bombers to devote a large fraction of her manpower and industrial strength to a purely defensive strategy. Finally, as all good strategy in war should take into account the probable conditions after the war, it is worth noting that one effect of the destruction of Germany's industrial potential has been that the victors have had to contribute to the restoration of the fortunes of the vanquished.

However, what is now more important to consider is whether the advance of science is likely to make strategic air attack more or less effective as time goes on. One of the chief reasons why it was nothing like so effective in the last war as enthusiasts predicted was that the errors of bombing were so great. It is certain that new scientific methods will greatly reduce the errors; but they will remain large in comparison, say, to the errors of gunfire. Taking all factors into account my own conclusion is that attack on objectives at distances greater than 500 miles from the base of operations is unlikely to be worth the effort involved if ordinary explosives are used. The invention of the atomic bomb makes a very great difference. The accuracy of bombing necessary to produce a decisive effect is far less than if ordinary explosives are used. Five years ago an atomic bomb created a blast pressure equivalent to that of the explosion of 20,000 tons of T.N.T., and in addition caused lethal effects over a wide area through burns and harmful radiations. Since then the design of atomic bombs must have been greatly improved, and it has been publicly announced that American scientists and engineers are seriously engaged on the development of a far more devastating weapon, colloquially known as the hydrogen bomb.

We must neither minimise nor exaggerate this serious threat. It has been said that there is no defence against the atomic bomb. It was also said, fifteen years ago, that there was no defence against the bomber. There is no defence against a bullet if one happens to be in the way; but many thousands of bullets are shot off in war for every man who is killed. A few atomic bombs are not going to have a decisive effect on any nation provided morale is high. Numbers count, as in any other branch of war; and the rate of production depends essentially on access to sufficient raw materials and on the state of science in the nation concerned. The production of an atomic bomb calls for more highly skilled

scientists and engineers, on the average, than the production of any other implement of war.

The inventions of the internal combustion engine and of the atomic bomb have brought into great prominence the strategic importance of two minerals, petroleum and uranium. Modern war would be impossible without supplies of liquid fuel; the world sources of petroleum are concentrated in comparatively few regions, and the countries which not only control them but also have the technical ability to exploit them start with an immense advantage over those which do not. Great Britain, for example, whose strength in war depended fundamentally throughout the latter half of the nineteenth century and well into the twentieth on the exploitation of her rich sources of coal and iron ore, is now more dependent than ever on sea transport for her capacity to wage war, for it is only by sea that she can be supplied with liquid fuel. Nor is this conclusion likely to be seriously modified for many years by the technical success of processes for manufacturing liquid fuels from coal, for the annual production of the minimum quantities required in war would necessitate a capital expenditure, and an increased production of coal far beyond her present power. Germany, on the other hand, was forced to embark on the manufacture of liquid fuels from coal, before she went to war, in spite of all the economic disadvantages. She could not have gone to war without it; any more than she could have gone to war in 1914 unless the process of "fixing" nitrogen from the air for the manufacture of explosives had been a practical success. Both these new triumphs of chemical engineering were essential to her strategy. The vast lignite deposits in Germany provided a raw material more suitable for the manufacture of liquid fuels than British coal. But the scale of manufacture was not large enough, and in spite of her later control of the Roumanian oilfields and her extensive captures of stores in conquered territories, Germany never had enough for her full needs.

The essential raw material of atomic bombs is uranium, which is a radioactive element. Uranium is not exceedingly rare; it is found widely dispersed throughout the world. But so far as is known there are only a few rich deposits of uranium ores, such as those in the Belgian Congo. These deposits are therefore of high strategic importance, corresponding to the world's main oilfields. But there is this difference, that though it is technically possible to manufacture liquid fuels from coal, no method is yet known for manufacturing on a large scale radioactive elements from material that is not radioactive.

The normal civilian demands for uranium are insignificant compared with the possible demands for war purposes. In time to come this may change, for uranium may become a substitute for coal or oil as a source of power.

These, then, are some examples of the influence of science on strategy. But we must not overlook the more general influence of the application of science to industry, the fundamental strategic importance of which is that it continuously raises the productivity of labour. In many manufacturing industries of Great Britain one man can now produce as much finished goods in a year, on the average, as two men could do twenty or thirty years ago. This has the consequence that as men will willingly be content with a much lower standard of living if their country is in danger of defeat,

there is a great and always growing proportion of the working population of any highly industrialised nation which can be diverted into war production, or into the fighting services, in times of need. In the United States, where the application of science to industry is now more intensive than in other countries, productivity is so great that the standard of living can be sustained at a higher level than anywhere else in the world even though a large part of her manpower and other resources are diverted to the production of munitions of war. But though the increase of productivity depends essentially on the application of science, total production depends on the availability of all the many and diverse raw materials of industry. It is not possible to set a limit to the productivity of labour; as it continues to increase, the problem in war will increasingly become not so much a problem of production as of control of raw materials, the transport of the products to the theatres of war, and the efficient use of them in the face of the enemy. No new invention, no new advance of science, has yet diminished the strategic importance of sea communications. It is conceivable that in the future air transport will largely replace sea and land transport, but that time is still far distant.

To sum up, the tactical strength of the armed forces of a nation depends largely on the deliberate application of scientific discovery and scientific methods to the problems of war; but the strategical strength of a nation depends on the general state of science and industry, and an access to, and a sufficient share of, essential raw materials. One lesson to be drawn is that in these anxious times, when rearmament is necessary as a preventive measure against aggression, it must not go so far as to weaken the foundations of science and industry on which victory in war is built.

H. T. TIZARD

CHAPTER VIII

COMMONWEALTH CO-OPERATION IN DEFENCE

IN RECENT years there has been much loose talk about the predominance of the United States of America and Russia, and our own decline, in world affairs. It is, of course, true that as a result of bearing the brunt in two world wars we have lost to the United States our old position as the foremost financial and industrial country. Taking the Commonwealth as a whole, however, there is still no nation, or closely knit group of nations, with the same world-wide influence. In every continent there is at least one great nation of the British Commonwealth in a position to uphold, and if necessary defend, the liberties of free people and support the United Nations against Communism. The British Commonwealth is, as yet, the best organisation mankind has devised for the banding together of peoples of the world for the furtherance and protection of their way of life.

This state of affairs carries with it great responsibilities. It had been hoped that after World War II these responsibilities would be cultural, social, and political; but this is not to be. Once again our main pre-occupation is defence. Without adequate defence against the present threat we run a grave risk—amounting almost to certainty—of all our other aspirations being thwarted.

The British Empire was built up by degrees on somewhat haphazard, almost accidental, lines. There is no rigid pattern or carefully planned bonds of union and no two countries of the Commonwealth are governed, or administered, alike. Defensive measures have followed the same trend, with the great Dominions taking an increasing share, especially in war. Nevertheless, even with the experience of 1914–18 and 1939–45, we still have no properly integrated system for the defence of the Commonwealth as a whole. In the event of another war our man-power and other resources would be extended to the limit. The time has surely come when we should make a real effort to put Commonwealth defence on a sounder footing than at present—a footing more in keeping with the times in which we live and are likely to live for some time to come.

A careful examination of the problem reveals two features which are fundamental to its proper understanding, namely:

- (a) That the very structure of the Commonwealth makes dispersion of its armed forces inevitable.
- (b) That each Dominion and country of the Commonwealth should assume responsibilities and provide a fair quota of armed strength according to its location and resources—not only in war but in the conditions of to-day which we call “peace.”

Bearing these in mind—they are hardly open to contradiction—and that any plan for Commonwealth defence must also be integrated with the general policy of United Nations security, we can tackle the problem with some hope of offering reasonable suggestions. The remarks which follow

are made with full appreciation of the magnificent contributions of the Dominions and Colonies in two world wars. Where there is criticism it is with the sole object of making suggestions for producing a better Commonwealth defence policy in future.

A survey of Commonwealth defence in the twentieth century shows that in peace the major burden has hitherto fallen on the people of the United Kingdom. Early in the century the Royal Navy policed the seas, although to-day the Dominions have navies of their own. More recently air squadrons in the Middle East, in India (before partition), in Iraq, and in the Far East were practically all provided by the R.A.F. from personnel recruited at home. When we turn to the Army we find large garrisons in all parts of the world composed almost entirely of Imperial units—with an Imperial reserve, or striking force, located at home.

With few exceptions it can be said that to-day the Armed forces of the Dominions and Colonies are maintained in peace to defend their own territories. The responsibility for garrisoning ex-enemy countries and the less developed parts of the Commonwealth falls on the home country. The same applies to the regular fleet, air, and army units maintained as a strategic reserve at home, and elsewhere, to take the first shock in a major war or for despatch to a threatened area, such as Korea. The meagreness of our initial force sent to Korea is the measure of our difficulties.

In the past this division of responsibility—by which in peace the Dominions were responsible for local defence only—was a practical and equitable one. The threats to the Empire were less serious and less obvious than they have become more recently. The tempo of war was less great than it is to-day and a knock-out blow in a few weeks, or even days, did not have to be reckoned with. The home country was strong and powerful with immense financial resources and a predominant position in industry. The Dominions were only partially developed with small populations, little industrial capacity, and meagre financial resources. Except in grave emergencies, such as the two world wars, they could not be expected to provide for more than their own defence and a cadre organisation for expansion.

How different is the position to-day: The home country impoverished and short of man-power—due to the necessity of balancing her economy by an unprecedented export drive, and at the same time rearming on a huge scale. India and Pakistan—great sources of armed strength in the past—now so occupied with their own affairs, and rivalries, that they are hardly able to provide a single ship, airplane, or soldier between them for Commonwealth defence outside their own borders. An active aggressor at our gates; moreover, not merely politically aggressive but actually engaged in “hot” and “cold” warfare against us and our friends, and ready to seize every opportunity to bring about our immediate discomfiture and eventual destruction. Meanwhile the older Dominions have increased immeasurably in stature. They are now in every sense self-governing countries, with considerable populations, mostly self-supporting and with financial and industrial resources which give them high prestige in the councils of the world.

Yet under these changed post-war conditions the old system of Commonwealth defence continues with only minor modifications—the United Kingdom still bearing almost sole responsibility, except for the actual

local defence of the Dominions. The sea routes and skies are still policed by the Imperial Navy and R.A.F. In Germany, Austria, Trieste, the Middle East, Malaya, and Hong Kong the Army garrisons are mainly Imperial troops from the United Kingdom, equipped with material manufactured mostly in home factories. In Korea the Commonwealth forces are predominantly from the same source, although to a lesser extent.

It is, of course, true that modern methods of transport have speeded up the means by which armed forces can be re-deployed to meet changing situations. This is more particularly the case with naval and air units—provided that port and airfield facilities exist—but the movement of a large army is still dependent on the speed of the slowest ship in a convoy. Any advantages gained by increased speeds of movement are more than offset by the increased tempo of modern war in general—which enables a cunning aggressor to deliver a knock-out blow against the unprepared in a very short space of time.

It is clear that in present-day conditions—as outlined above—the existing system of Commonwealth defence is outmoded and a danger to our security. It is suggested that the time has come, and is indeed overdue, for a real effort to initiate a more efficient, more economical, and fairer system for the defence of the British Commonwealth and the means by which it can support the United Nations. To this end the following suggestions are offered.

POLICY

(a) That each Dominion, in addition to providing for its own defence, should—in proportion to its population and resources—provide in peace regular forces of all Services to garrison adjacent undeveloped territories and provide a reserve for employment within a certain area in an emergency.

(b) That the commitments of the Imperial Navy, Army, and Air Force be confined mainly to the defence of Europe, the partial defence of the Middle East, and the provision of a Commonwealth strategic reserve normally located in the United Kingdom.

(c) That Colonial forces, chiefly consisting of Army formations and units (on the lines of the old Indian Army) be formed (mainly from volunteers from Africa), with the primary object of garrisoning the Middle East.

(d) That in addition to the above the United Kingdom and each Dominion maintain part-time forces for home defence and as a framework for expansion in a major war. These forces would be on the lines of the Territorial Army and R.A.F. Auxiliary squadrons at home and similar forces already in existence in the older Dominions.

It is an interesting study to examine how these proposals would work out at the present time (May 1951) if we assume that agreement had been reached within the Commonwealth, that India and Pakistan had settled their differences, and that there had been sufficient time to raise the necessary formations and units, train and equip them, and bring the organisation into being.

The first step in this perhaps fanciful conjecture is to allot areas of



AJ1 Bomber landing on Aircraft Carrier



Helicopter landing on Naval Supply Ship



The American two-man tank destroyer—the Bazooka

responsibility to the various countries of the Commonwealth. These might well be as follows:

(a) *United Kingdom*

Europe and the Middle East—in the latter British forces being augmented by Colonial formations and units, mainly African Army units.

(b) *Australia, Ceylon, India, New Zealand, and Pakistan*

South-East Asia and the Far East—in addition to the defence of their own territories.

(c) *South Africa*

In addition to the defence of their own country, the provision of small army and air contingents in the Middle East—plus a strategic reserve to reinforce any part of Africa in an emergency.

(d) *Canada*

The defence of the Arctic approaches to the American continent and the provision of a strategic reserve to reinforce Europe in the event of a major war. These two roles would enable the Dominion to work in close co-operation with the U.S.A., which has similar commitments.

We can now picture, in very general terms, what the situation might have been in the early months of 1951, with “hot” and “cold” warfare activities in progress in the Far East and an increasing threat to Europe.

(a) SOUTH-EAST ASIA AND THE FAR EAST

Naval units provided mainly from Australia, Ceylon, India, New Zealand, and Pakistan. As there is no serious naval threat in these waters only a small fleet is required to support the land forces and for anti-submarine and mine-sweeping operations. The provision of such a fleet would be well within the capacity of the five Dominions concerned:

Hong Kong. Army and R.A.F. units provided mainly from Australia and New Zealand.

Malaya. Anti-terrorist operations undertaken mainly by Army and R.A.F. units from India, Pakistan, and Ceylon plus the Gurkha Brigade and a small British contingent.

Korea. As this has developed into a major, although at the time of writing still localised, campaign in support of the United Nations it is reasonable to suggest that a Commonwealth Army Corps and a considerable Air contingent with formations and units from the United Kingdom and all Dominions might have been in action early in the Korean campaign. Even if none of these contingents exceeded a division in strength—or even a brigade group—such an arrangement would have provided a formidable force, numbered in tens of thousands and influencing the course of the campaign to a major extent. It is difficult to think of any measure which would have enhanced Commonwealth prestige so much in the councils of the nations.

(b) MIDDLE EAST (INCLUDING THE MEDITERRANEAN)

Naval and Air units mainly from the United Kingdom, augmented by perhaps a small air contingent from South Africa.

The present considerable all-British land forces in Egypt, North Africa, etc., might have been replaced by a small British contingent, a small contingent from South Africa (with a larger force ready to reinforce), and as many divisions of African troops as necessary.

(c) EUROPE

Although mentioned last, Europe is by far the most important potential theatre of operations. This is the *vital* place, compared with which all others are merely "side-shows." With the easing of the more remote overseas commitments, as outlined above, an Imperial force of several divisions (grouped to form an army of at least two corps) could have been stationed on the continent at General Eisenhower's disposal, backed by other divisions at home to form a strategic reserve.

It does not require a trained strategist or access to "top secret" information to appreciate the advantages of a system of Imperial defence based on these proposals. Any well-informed individual will realise how immeasurably superior they are to those which actually exist. Under such a plan each portion of the Commonwealth would make a contribution approximately commensurate with its resources and would undertake tasks within comparatively easy reach of its home base. It would be fair, economical in man-power, equipment, and shipping, and at the same time provide us with a much higher degree of safety than our present arrangements. In making this statement recently approved increases, mainly in army formations—including the provision of new infantry and armoured divisions for Europe—have not been overlooked. Even when these are ready to take the field, and it is doubtful if they are yet, our Land Forces in Europe will remain deplorably weak for their responsibilities. They can hardly be otherwise until the Imperial Army is relieved of most of its far-distant overseas commitments.

Although the Naval and Air aspects are important, the above proposals place the main emphasis on Land Forces. The Army is strategically less mobile than the other Services, the numbers involved are much greater, and its process of mobilisation necessarily more cumbersome. No attempt has been made to give details or numbers of fleet units, army formations or air squadrons. The necessary information is obviously lacking except in official circles, and the situation changes constantly.

It is a very simple matter to devise a "paper" plan or organisation, but a very different matter to carry it out. It is, however, as well in any undertaking—particularly one of a military nature—to set an ideal or standard at which to aim, even if the prospects of attaining it are remote. Indeed, it is a commonplace that an aim which is not almost unattainable does not set a sufficiently high standard. This subject has, of course, been discussed on and off for the past thirty years, but the proposals had little chance of

acceptance when the Dominions were in the early stages of self-government. Now, when all free nations are banding together for mutual security, much closer Commonwealth co-operation in defence is a practical proposition.

It is not claimed that the proposals outlined above are more than an outline suggestion; but they represent a fairer, more efficient, and tidier organisation than the present arrangements. There are, of course, many fences still to be taken before this project, or one on similar lines, can be implemented. The following are among the more obvious difficulties:

- (a) *The machinery for controlling and co-ordinating the Empire forces.* Obviously, something more elaborate than the present system of loose consultation is necessary if all parts of the Commonwealth are to maintain considerable regular forces in time of peace. It may be that a truly *Imperial* General Staff for all Services is required, rather than one which is Imperial in name only. We have the experience of the procedure adopted in two world wars, and from this it should be possible to evolve a workable organisation. If it is possible, as it has been, to have fully integrated British and U.S.A. staffs it should not be impracticable to adopt the same procedure for the Commonwealth.
- (b) *The difficulty of raising regular forces* in peace in Dominions with scattered populations and whose people find it difficult to appreciate dangers which are only too apparent to the inhabitants of Europe. This is a very real difficulty under the Democratic system of Government.
- (c) *The looseness of the Imperial link* in the cases of South Africa, India, and Pakistan, all of which are troubled in some degree by internal conflicts, and whose status in the Commonwealth is less firm than we would wish. It is to be hoped that any suspicions or grievances which still linger may soon be dispelled and that they will shortly become—as in the past—in every sense true partners in our Commonwealth of Nations.
- (d) *The differences between India and Pakistan*—mainly over the future status of Kashmir. As long as tension lasts neither of these new Dominions are likely to contribute to Commonwealth defence outside their own frontiers. In the meantime the forces of Communism in Asia are advancing every day and by the partial occupation of Tibet are at their very gates. India and Pakistan, with their martial prowess and tradition, have it in their power—if they can only settle their differences—to create conditions which will not only deter aggression in their direction but enable them to assume their rightful role in the general scheme of Commonwealth defence and in support of the United Nations.
- (a) *The difficulty of raising a large Colonial Army.* Obviously the main recruiting ground for a Colonial Army would be Africa, and political conditions in the African colonies are not perhaps ideal for such a project at the present time. Most of the African countries of the Commonwealth are in process of receiving a considerable measure of self-government, and in the early stages this is usually accompanied by some bitterness. Nevertheless, the African has never been slow to volunteer for military service,

and with the prospect of a life career under good conditions there should be no shortage of recruits. The problem is faced with difficulties, but they are not insuperable.

The theme of this article is the concentration of the Imperial Forces (i.e. those recruited in the United Kingdom) on the defence of Europe, and the assumption of responsibility for the defence of the Pacific, Asia, and the Middle East by other parts of the Empire. It is not claimed that the detailed proposals made are perfect, or capable of early fulfilment in their entirety. It is, however, submitted that they are not unreasonable as the framework of an aim or basis of an ideal. Unless we accept, and accept quickly, the principle of concentrating Imperial armed strength nearer home there can be no security in Europe—which is the potential battle-ground for the maintenance, or destruction, of the Democratic way of life.

In another chapter of this volume it has been emphasised that our strategy is now largely that of the United Nations. It is submitted that the proposals made in the foregoing paragraphs conform to this conception to a marked degree.

NOTE. I wish to make clear that the views expressed in this article are entirely my own. As far as I know they have no official backing, and are certainly not inspired by any official encouragement.

C. N. BARCLAY

CHAPTER IX

CHINESE ARMED FORCES

MORE THAN in most countries, China's armed forces have been in a state of transition during the past year. It is impossible to write with any degree of certainty of methods of organisation and equipment which have been so rapidly changing, though there has been a tendency to exaggerate the changes in some quarters.

The civil war in China virtually ended in 1949 when the whole of the mainland was overrun after the new government had been set up in Peking in October. Apart from a settlement with Tibet (since achieved), the only major military task remaining to the new government was the attack on Formosa. With that successfully completed, the civil war would have been over after twenty years of intermittent struggle with the Kuomintang and eight years of anti-Japanese guerrilla fighting. The task of destroying the Kuomintang in Formosa was formidable, since for the first time the naval and air power of their opponents was a serious obstacle. Landing vessels were built, special airstrips prepared on the coast of Fukien, and anti-aircraft guns were brought to the area. All this was done with the assistance of Soviet advisers, but the outbreak of war in Korea and the American decision to neutralise Formosa from attack changed Chinese plans. The attack on Formosa was called off and before long China had intervened in Korea.

At the beginning of 1950 the armies of the people's government totalled over five million. This inflation was as much as anything due to the large numbers of Kuomintang troops who had surrendered—often in whole divisions—and for whom there was no easy or safe method of disposal apart from absorbing them into the Communist Armies. Early in June of the same year Mao Tse-tung announced plans for demobilisation. Presumably troops for the Formosa operation had already been allotted and the government was confident of victory. Other troops had been given the task of assisting in land reclamation schemes, in railway building, and in helping peasants with spring sowing. Some of the troops who had fought their way down from Manchuria now began to move north again, a movement which was accelerated when the Korean war broke out. In November Chinese armies under the guise of volunteers intervened on behalf of the North Koreans.

Before this happened China had had inflated armies which needed reorganising and demobilising; where heterogeneous equipment needed standardising. China, in short, would have had for the first time a genuinely national Army. But in intervening in Korea the Chinese committed themselves to a course which changed this situation entirely. Their experience in the past twenty years had been of guerrilla fighting, the besieging of towns, and a skilful use of political intrigue to back up their military efforts. Their equipment had been adequate for these purposes and they were highly trained. But in Korea they were to face assaults on well-defended positions on a scale they had not had to face more than

once or twice in the civil war and then against much inferior troops. Both their training and their equipment were inadequate for this task. They had not had, as the North Koreans had had, since their government was set up by the Russians after the war, the benefit of a military mission, modern armoured vehicles, artillery, and transport. It is true that some Russian assistance had begun two years before, but this had been limited and was not intended to serve much more than in the defence of Manchuria, which the Russians regarded as a priority for their own purposes. Similar limited assistance had been given for the attack on Formosa. There had been no attempt made to train or equip the Chinese Army as a whole. China's Army was its own. It is possible that after the conclusion of the Sino-Soviet pact in February 1950 Russian assistance might have been accelerated, but Chinese intervention in Korea made it essential. Hence the transition from an army which was the result of twenty years evolution in the civil war to any army which began to be equipped and trained with Russian assistance (though the equipment seems to have been meagre) and which now was acquiring experience on the battlefronts in Korea.

THE ARMY AND THE REVOLUTION

To understand how these forces were built up some account of the Communist rise to power is essential, for the Communist Army soon became the most important part of the Communist movement. In 1927, when the right wing of the Kuomintang seceded from the government then existing at Wuhan and set up a new government at Nanking, the Communists themselves split in their attitude to the new situation. Some of the party wished to carry on a purely political movement organising the workers in the large towns until by the recognised processes of agitation and strikes they might be able to seize power.

Others, of whom Mao Tse-tung eventually became the leader, felt that it was the peasants rather than the workers who should be organised and that with the aid of an army a Communist area could be successfully held. Thus it was that from the time the first base was set up in Kiangsi in 1928 until the new government proclaimed itself as the government of all China twenty-one years later the rise of Communism was synonymous with the rise of the Communist armies.

In Kiangsi the movement was subject to continuous attack from the Kuomintang, and eventually in 1934 it was decided to move to a new base. There followed the epic Long March, after which a new base was set up in Shensi (where a Communist group was prepared to receive them) with its capital the small town of Yen-an. From then onwards the Army grew into a well-trained and disciplined force. Already leaders had come to the front and they remain the military leaders to-day. Their importance was no less political than military, for their strength had developed with the movement and their political authority grew with their military prowess. All of them now hold important positions politically as well as militarily, though since the government was set up in 1949 new figures have emerged in the civil administration.

Chu Teh, aged 68, is regarded as the father of the Army and Mao Tse-tung's most faithful associate. In the early days of the new government his portrait always hung beside Mao, but latterly he has become more of

a figurehead, though he is still the most popular figure in the Army and remains Commander-in-Chief. His Communist sympathies were aroused in Germany, which he visited after World War I, and he returned to China by way of Russia. He helped Mao in the building of the Army in the early days after 1927 and has remained the senior commander.

Hsu Hsiang-chien is nominally the Chief of Staff, but it is reported that he has had serious disagreements with political leaders. He is also believed to have been in bad health for some time, and since the new government was formed he has not apparently played any part in military direction. He was the leader of revolutionary groups in Szechuan who joined up with the Communist main body in 1935 during the Long March. In Yen-an he was responsible for strategic planning of guerrilla campaigns against the Japanese.

Peng Te-huai, aged 56, started his career as an officer in the Kuomintang armies when they were based on Canton, but he led his troops over to join the Communists in 1928. He took part in the Long March and is now Deputy Commander-in-Chief. He also commands the 1st Field Army based on north-west China with headquarters at Sian, of which area he is also the military administrator. It is rumoured that he was in command for a time of Chinese troops in Korea. He is believed to be a close and well-trusted friend of Mao Tse-tung.

Lin Piao, aged 46, is the youngest of the Communist military leaders and probably the most brilliant. He was a graduate of the Kuomintang Whampoa military academy and commanded a battalion at the age of 21. He joined Mao Tse-tung in Kiangsi in 1930 and took part in the Long March, though he nearly died in the course of it. In Yen-an he commanded the military academy and in the civil war from 1946 onwards he was in command in Manchuria, bringing his troops south in 1949 for the advance on Canton. He commands the 4th Field Army, which is nominally stationed in the central south area based on Hankow, but the first Chinese units sent to Korea are believed to have been drawn from this army and it is likely that Lin Piao commanded them there. He is also nominally the administrator of the central south area.

Nieh Jung-chen is now Acting Chief of Staff. Like so many other of the Communist Leaders, his interest in Communism began in France, where he was a student after World War I, and he too moved on from there to Moscow. He studied at the Whampoa military academy and served with the Kuomintang forces before going over to the Communists. For a year after the new government was formed he was the Mayor of Peking. He now commands the 5th Field Army based on North China, though it seems likely that he relinquished the post of Mayor of Peking because of increased military responsibilities on account of the Korean war.

Yeh Chien-ying, like Nieh Jung-chen, is a graduate of the Whampoa military academy and after joining the Communists served on the Staff in Yen-an and in the latter stages of the civil war. He is one of the few Cantonese who holds a high position in the government and he is now the military governor of Kuangtung province.

Liu Po-cheng was one of the most successful guerrilla commanders against the Japanese in North China and against the Kuomintang in the civil war fighting between the Yangtse and the Yellow river. He commanded the 2nd Field Army which struck south-westwards after the

Yangtse was crossed, and is now the military administrator of the area with headquarters in Chungking. Troops from his armies were responsible for the initial advance into Tibet, and other units are believed to have been transferred to Korea.

Chen Yi, another Chinese student in France who joined the Communist party there, stands somewhat outside the ranks of his fellow generals, since he was associated with the Communist New 4th Army which conducted guerrilla campaigns against the Japanese in the Yangtse basin area and was therefore directly less under the control of Yen-an. He is now Mayor of Shanghai and commands the 3rd Field Army. In the early part of 1950 his forces were allotted the task of an attack on Formosa; and many preparations were made, such as the training of troops in landing operations, the building of special airstrips, and the construction of several thousand small landing craft, before the operation was called off.

Finally, mention should be made of *Chou En-lai*, who, though no longer directly concerned with the Army (though he is a member of the Military Council), was for many years the leading strategist of the whole civil war. He began his career as an instructor at the Whampoa military academy. He may be regarded as one of the three most powerful men in the new government.

ORGANISATION

As might be expected, the Army has a political directorate which is parallel at all levels to the military command (though all the generals mentioned above are members of the central committee of the Communist party). The Army Commands are based on the regional administrative structure, as China is still regarded as being under military administration. These are as follows:

- 1st Field Army—north-west China
- 2nd Field Army—south-west China.
- 3rd Field Army—East China
- 4th Field Army—central south China.
- 5th Field Army—north China.

Manchuria is deemed to be under civil administration and there is no army command directly centred on it.

The present strength of the Army is variously estimated. At the beginning of 1950, when the fighting on the mainland had almost ended and the maximum number of Kuomintang troops had been absorbed the official figure was five million. This was soon reorganised on the system the Communists had already established in their old areas of a people's militia responsible for local security and organised on a regional basis. The Army proper was reorganised at a strength of about two to two and a half million and it was intended that this should be reduced to a figure of about one and a half million during the following year. At this time the war in Korea began and nothing more was heard about demobilisation. By the middle of 1951 there were persistent reports of the calling up of militia for embodiment in the Regular Army. There were also big campaigns to get volunteers to join the forces in Korea. It is estimated

that a quarter of a million volunteers were finally selected and went for training in North China. By June there had also been reports of straightforward Army recruiting, and such is the prestige the Army enjoys (probably a higher prestige than any other branch of the new administration) that a good many recruits were obtained. A rough estimate of present strength might be two and a half to three million in the Regular Army and about two million militia, though this estimate excludes losses suffered in Korea. The Regular forces are organised in infantry battalions grouped in regiments of three battalions each, which are in turn grouped in divisions of three regiments. This makes a divisional strength of 10,000–12,000. Cavalry units are quite common in the north, where the stocky Mongolian ponies provide good mounts. There is a separate organisation of l. of c. troops.

There is no doubt of the high standard of discipline and training maintained by the Army. The tradition of over twenty years is both potent and honoured. It is a rare thing in Chinese history for the Army to be so respected. There are no badges of rank and virtually no pay at all. Though not always well clothed by Western standards, the new Army is certainly better off than its predecessors and in its relations with the civil population has always paid for supplies. On the other hand, it is probably true that the Chinese tradition which gives a general control not only operationally but over all appointments to his staff so that the Army becomes, in effect, his army and has a loyalty to him quite apart from national loyalties still persists. It would be more likely that a change in the balance of power in the new government would come from the military than the civil side.

EQUIPMENT

Not until Chinese intervention in Korea, when their need for arms became unanswerable, did Russian assistance become more than a token. It was certainly without any aid from Russian weapons that the civil war was won. Apart from the numerous rifles and machine guns that the war lords of the 'twenties had left scattered about China, the principal source of Communist weapons was those they captured from their enemies. During the war this had been from the Japanese, during the civil war it was from the American equipment supplied to the Kuomintang. Much of this had been supplied during the war for use against the Japanese, but had been kept for use against the Communists against the resumption of the civil war that neither side believed had ended. During the civil war from 1946 to 1949 a vast quantity of equipment was captured and even the inflated army with which the Communists finished was well supplied with small arms. A good deal of artillery was captured, but not enough to equip the Army by any modern scale, as later became apparent in Korea. Many trucks were also captured, but again not sufficient for the supply lines that proved necessary for Chinese troops in Korea. The mobility of a civil war enabled troops to live off the land and move fast across-country, but the weaknesses of the Communist supply system were far more apparent in the positional warfare of Korea. A good deal of horse transport is used.

How much new equipment has been supplied to the Chinese by the

Russians since they were involved in Korea is hard to say. What seems probable is that it has been far less than the Chinese hoped or needed. There has been some Russian assistance before this in the form of tanks and anti-aircraft guns, but these were token supplies by comparison with what had been supplied to the North Koreans. There are arsenals in Taiyuan and in Mukden both able to produce small arms and perhaps small mountain guns. It may be that Russia has supplied machine tools for other arms production, but it would seem that either the Russians must supply heavy equipment in quantity to China or their Army will remain little more than an infantry force. Nevertheless, Chinese intervention in Korea has begun the change-over from an army experienced in guerrilla warfare to one experienced in positional warfare against Western troops, and this is bound in due course to change the structure and organisation of the Army.

NAVAL FORCES

Naval forces played little part in the civil war and at no time did the Communists make use of the sea in their operations. The only notable defection to the Communists from the Nationalist Naval forces was the cruiser Chungking (ex-H.M.S. Aurora), which left the Yangtse for the north but was sunk in the harbour at Hulutao (Manchuria). There have been reports that she has been successfully salvaged, but it seems improbable that she could be fit for operations. Another destroyer blockading the Yangtse also went over to the Communists after a mutiny on board but was also successfully sunk by Nationalist bombers. Other vessels captured were two frigates undergoing repairs in Shanghai when the town fell to the Communists. Otherwise the only vessels the Communists acquired were a number of river patrol craft. They have also purchased two corvettes which had been sold as merchant vessels and stripped of their armament. These are no doubt being rearmed.

Thus at the end of the civil war on the mainland the balance of Naval force was still strongly in favour of the Nationalists in Formosa, and the blockade of Shanghai produced no Communist reaction for a long time and was only finally broken with the arrival of aircraft. Since the end of 1949 there is some reason to believe that the Chinese have got Russian assistance in Naval development. But there seems no reason to believe that the Chinese pay a great deal of attention to sea power. The present rulers are essentially from the interior and their whole conception has been to reverse the trend of the past 100 years and lessen China's dependence on the outside. They therefore place little reliance on Naval power. Reports are that they have been supplied with minesweepers, minelayers, and small submarines. These are probably true, though it is doubtful again if more than a token force has been given to them. Such craft would only be of use to defend themselves against a landing from Formosa.

Most of the Chinese Navy were trained in Britain, and British traditions still persist both on Formosa and the mainland. A good many individual sailors defected to the Communists and more are no doubt being trained by the Russians. Most Naval establishments are in the north, though Tsingtao is a centre and recent reports speak of plans to establish a Naval base at Yulin on Hainan island.

AIR FORCE

Very few fighters and bombers from the Nationalist side went over to the Communists during the civil war. They were better paid than the soldiery and were treated somewhat as Chiang Kai-shek's bodyguard. About eight fighters and a dozen bombers either went over or were captured, but they were never put into use even when Shanghai was being bombed in the early part of 1950. In March of that year planes did appear to defend Shanghai and they were Japanese models, no doubt captured by the Russians in Manchuria and handed over to the Chinese. Later jet planes of Russian make began to appear. It is probably true to say that Russian assistance to China has been concentrated far more on the air arm than any other. Air training centres were certainly in existence in Manchuria at Harbin and Kiamussu as early as the middle of 1948. It is quite wrong to assume (as was often suggested in Korea) that China could not possibly have enough trained pilots to fly the jets which they later on began to get in larger numbers. It may be that the Russian intention was to safeguard the Manchurian frontier and that they considered this could best be done with air power. How many planes have been supplied to the Chinese it would be very difficult to estimate, though a figure of not less than 500 may be hazarded. These consist of fighters and fighter-bombers as developed for the Russian Air Force. In Korea the Chinese only used these planes defensively over the Yalu river area in spite of a claim in their propaganda that they needed more. The reason probably was that they were reluctant to take any step which might spread the conflict. Russian influence, therefore, is far stronger in the Chinese Air Force than in the Army and Navy. Many advisers have been to China for all branches of the Service, but they seem mostly to have been technicians performing a limited and temporary function. The Chinese Army is in this respect wholly unlike any of the armies in Eastern Europe. It stands right outside Russian influence in its command, and still largely so in its equipment. It is unlikely that the Russians could contemplate any change in this respect.

NATIONALIST FORCES IN FORMOSA

Army.—About 500,000 to 600,000 well equipped and fairly well trained, though it would be hard to say whether their fighting capacity in China would be any better in practice than it was during the civil war.

Navy.—A total of fifteen vessels consisting of ex-Japanese destroyers, American destroyer escort, and minelayers. It is not a well-maintained force and has not now been added to for some years.

Air Force.—About eighty fighter aircraft and fifty bomber aircraft of American wartime types (B.24, P.51, etc.). It is not now a match for air power which the Communists can deploy.

Since the despatch of an American military mission to Formosa in May 1951 it is not known what fresh equipment has been or will be supplied to Nationalist forces.

RICHARD HARRIS

CHAPTER X

THE PATTERN OF FUTURE WAR

THOUGH ALL hypothetical problems are largely speculative, there is one thing certain about the pattern of future war. It is that, like all past patterns, it will be the military expression of the civilisation to which it belongs. New political ideas, new social, economic, financial, and other systems may modify those of to-day, and assuredly science and industry will not stand still; nevertheless, not until our present civilisation is radically changed will the pattern of war be radically different from what it is. Therefore the question is: what is the existing pattern?

Occultly its definition is contained in the combination of four words, the first two are "world war"—the extension of all major conflicts to global dimensions—and the second two are "total war"—war embracing all human activities. Wars of this pattern are not international conflicts as commonly understood. Instead they are struggles between dominant groups of nations, which in war time, if they cannot persuade, will then by force or fear compel all nations outside of them to take sides in the war. Therefore, in war time the age-old status of neutrality is now outmoded; all nations, whether they like it or not, are either active or passive belligerents. To-day the dictum is that war is indivisible—that is, there can be no islands of peace in a world deluged by war.

This has become increasingly noticeable during the last half century, and compared to it no other period has witnessed wars so vast, destructive, and hateful. Equally noticeable is it that each successive peace interval has become more warlike, until to-day Clausewitz's well-known saying that "War is a continuation of state policy by other means" has been inverted. Hence the term "cold war" as applied to the present interval of peacefulness, which is the negative half of a permanent state of "wardom," the positive half of which is called "hot war"—war as normally understood.

What is the fundamental cause of the change from international conflicts, such as the Franco-Prussian and Russo-Japanese wars, to the "wardom" of to-day? It is essential that it be diagnosed, for otherwise no clear understanding of the existing pattern of war and its future is obtainable.

Throughout history the causes of war have fallen into two general groups—the optional and the imperative. In the first they are multiple, springing from fear, insecurity, greed, ambition, etc. In the second there is but one, the biological cause, which is rooted in food and population. Whereas the first group can be controlled by the will of man, the imperative cause is governed by his instinct of self-preservation. Food is the great fundamental, and it takes precedence over all man's other needs, for to live he must eat, and if he cannot eat he will fight for food.

When civilisation—in this context usually termed "barbarism"—was based on hunting for food, war, however infrequent, was endemic, as is to be seen in the civilisation of the pre-colonial American Red Indians. When a tribe outgrew its hunting grounds, new ones had to be sought, and

the immediate way of gaining them was to exterminate a neighbouring tribe and annex its lands. In pastoral civilisation it was much the same. An increase in population or in cattle, a change of climate or a prolonged drought, would set in motion hordes of people who with their flocks and herds would seek new grazing grounds by over-running neighbouring territories, driving their inhabitants before them.

Because in agricultural civilisations food can be stored, the pressure of hunger is less acute, and because normally the human death rate balances the birth rate, the biological cause of war is kept within bounds. Generally speaking, this equilibrium held good until the advent of our present industrial civilisation, when a world-wide crisis began to develop.

The reasons for it were examined by Plato well over 2,000 years ago. He pointed out that the biological cause of war was endemic in an industrial civilisation. In illustration, he took the city-states of his day, small defended towns or villages, whose inhabitants farmed the neighbouring lands. He showed that, as long as the citizens remained primitive agriculturalists, wars between city states were infrequent. But once an artisan class arose within the cities, the field lands becoming insufficient to sustain both farmers and artisans, the pressure of population on the food supply automatically led to expansion through war, the object being to increase the food-growing area at the expense of neighbouring city states. In essentials this is what is happening to-day.

Until about the middle of the eighteenth century, because civilisation was based on agriculture, normally European nations were self-sufficient in food. But the advent of the industrial revolution led to cities growing in size and number. The artisan classes multiplied, and the goods they produced gave rise to many other classes of non-agricultural workers. Rapidly the balance between food and population was unhinged, the latter increasing and the immediate sources of the former decreasing or becoming insufficient.

To make good the second, colonisation was stimulated, and foreign trade, which had hitherto mainly consisted in luxuries, became more and more directed towards obtaining necessities: cheap food to feed the people and raw materials to supply the factories, the produce of which was needed to exchange for food and raw materials. The result was not only an increase in population but also in competition between the industrialised states. Thus far nations had fought each other mainly for non-essentials; now increasingly they were to fight each other for the one essential, food, and for raw materials which when manufactured bought food and produced armaments and all the paraphernalia of the modern industrialised state.

Thus we enter the age of trade wars, wars essential to the sustenance of nations and the maintenance of employment, and, be it noted, unemployment is a visible sign of approaching starvation. Trade becoming universal, every quarter of the globe was ransacked for food and raw materials, and everywhere markets were sought in which to sell manufactured goods. Thus war, following trade, also became more and more universal until, with the opening of the present century, we enter the age of world-wide wars.

In September 1919 looking back on the first of these conflicts, President Woodrow Wilson said: "Why, my fellow-citizens, is there any man here, or any woman—let me say, is there any child here—who does not know

that the seed of war in the modern world is industrial and commercial rivalry? . . . This war, in its inception, was a commercial and industrial war. It was not a political war."

The same may be said of World War II. It was not Hitler's political doctrines which precipitated it—it was the success of his economic experiment based on direct barter and subsidised trading, because it enabled him to avoid or jump his competitors' tariff walls, under-cut their trade and swell the ranks of their unemployed.

Yet in spite of his considerable success, like that of all other industrialised countries, Germany's position was an artificial one, for her balance between food and population danced on a knife-edge. Realising this, Hitler determined to expand his *lebensraum* by conquering the Ukraine, the granary of Russia. With it, and we can only presume after the bulk of its population had been either exterminated or shifted eastwards, for a long time Germany would be a self-sufficient country, her agriculture balancing her industries.

The second of the world conflicts was marked by a ferocity not witnessed for centuries, and its chief victims were the civil populations. It was as if Nature had whispered to man: "Destroy the cities you have built, massacre their inhabitants and go back to the field lands I have given you." During it, not only was a new word, "genocide"—the deliberate elimination of populations by massacre or other means—added to the dictionary, but when the war ended, like cattle fourteen million people were herded from one land into another to make room for their conquerors, and of them four to six million are said to have perished.

Hiddenly, it was an anti-population war in which the search after food, in all its many forms, was the driving force. Nevertheless, it solved next to nothing, because populations were not sufficiently reduced, and to-day we are told that twenty million more children are yearly born to swell the world's over-crowded peoples.

What is the answer to this tremendous crisis which is engulfing the world? It is not whether Democracy or Communism is to dominate; it is whether man is going to eat. Therefore it matters not what else is attempted, for if men are not going to eat they are going to fight, and the result will be wars of extermination in order to break the over-population blockade.

Though Western civilisation is still rooted in the old conceptions of Christendom, its main expression is industrialism, which socially has substituted for the feudal baron and his serfs and the great landlords and their peasantry, the factory owners and their workers. The revolt against the inequalities of the third of these divisions of society found its expression in Socialism, the forerunner of Communism, which adopted the Christian conception of heaven and hell, but inverted Christian doctrine by placing them in this world instead of in the next. Hell was bracketed with capitalism or the bourgeois state, and heaven with a future and hypothetical stateless society of mundane angels in which equality was to be as absolute as in an ant hill.

To attain this uniformity, the communist holds that it is necessary to "liquidate" existing civilisation. Thus it has come about that the world is now faced with a second Reformation. Hence the pattern of war to-day is increasingly taking on an ideological, in place of a political, character.

In fact, in the struggle between Democracy and Communism we are returning to the age of the wars of religion.

These wars are extra-political and unconditional, and their aim, the extermination of an opposing priesthood and its followers, explains their ferocity. They are in effect a return to the barbarism of a hunting civilisation, the extermination of a cult replacing the extermination of a tribe.

Whereas Hitler's object was largely an economic one—the extension of his *lebensraum*—his opponent's was patently an ideological one. The Western allies set out to destroy Hitlerism—a cult—and, Russia, their Eastern partner, to destroy Fascism—a cult—which, according to the Russian definition, includes all political cults outside Communism, and therefore Western Democracy in its several forms.

All four allies were proselytizers. In each country over-run by the Russians the ruling and propertied classes were exterminated and the rest reduced to a proletariat and compulsorily communised. On the war ending, the four allies resorted to *ex post facto* law in order to rid themselves of the more prominent of their recent opponents, de-nazifying their followers and re-educating the rest. Furthermore, the Americans, British, and French established compulsory governments—democratic instead of communist.

The difference between these two series of happenings was but one of degree; for though Russian methods were the more barbarous, the aim of one and all was to destroy an economic faith. However absurd and criminal these acts will appear when distance allows them to be brought into focus with what hitherto has been considered to be the conduct of civilised warfare, they have set a precedent which in another world conflict will “justify” the victor or victors massacring entire populations.

Thus to the anti-population wars, which the biological cause of war has released, will be added anti-population peaces, which are likely to be even more annihilating. We therefore see that ideological warfare and the biological cause of war walk hand in hand. The first is psychologically a by-product of the second, both springing from the instinct of self-preservation.

Though the logical solution of this tremendous problem is clear—namely, first to cease fighting and proselytizing and instead increase ploughing and sowing, and secondly to regulate the growth of population according to the food supply—man is not a logical creature; he is profoundly illogical and basically irrational. Therefore it may be assumed that for years to come the existing pattern of war will not only continue but increasingly develop along its present lines. Even if by means of a magician's wand a compact could be arrived at whereby the nations agreed to lay aside their ideologies and live in peace, unless a permanent solution to the over-population problem is found, the only change would be the replacement of the horrors of war by the horrors of revolution or else by world-wide starvation.

Accepting that the pattern of war is fixed, the next question which arises is the pattern of future warfare—that is, the use made of the means of waging war within the framework of the pattern of war itself. Here we are faced with a far more speculative problem because of the enormous influence science is now exerting on war. Inventions pour out of the workshops and laboratories in profusion; many are secret and therefore

publicly unknown; many, though new, are still in the experimental stage; many have been tested in war and yet are but partially understood, and some are but developments of means of waging war as old as war itself. To attempt to regiment this multitude of means is out of the question, nor is it necessary in order to plot the main directions warfare is likely to take.

Although throughout history armaments have continually changed, there have been only two great revolutions which have transformed the organisations of armies, and both took their root in a new means of mobility. The first was the introduction of the horse for military purposes some 5,000 years ago. What was its primary influence? It was not that it enabled the foot soldier to fight mounted; it was that it relieved him from the necessity of turning himself into a pack-animal. By increasing his means of supply, it revolutionised war logistically—that is, from the point of view of transport and supply—and in this fundamental revolution all other changes due to the horse had their roots. Thus the pattern of warfare was fixed for thousands of years.

The next great revolution in mobility set in with the industrial revolution and came to fruition in the technical revolution which opened towards the close of the last century. During the first, naval warfare was revolutionised by steam power; and the railway, by facilitating troop and supply movements, so vastly increased the size of armies that the Napoleonic conception of "the nation in arms" became a reality. The second gave birth to a multiplicity of inventions, and from the point of view of military mobility the two more important were the perfection of the internal combustion engine and wireless telegraphy.

These two inventions introduced warlike possibilities which went far beyond anything accomplished either by gunpowder or steam power. The first not only led to a revolution in transportation, and therefore in land warfare, but by making flight possible it raised war into the third dimension; and the second virtually raised it into the fourth, because to all intents and purposes wireless transmission of energy annihilated time as well as space. Thus two new battlefields were gained—the sky and the ether—the one to be dominated by the aeroplane and the other by the radio and the science of electronics. So the pattern of future warfare was set.

During the Russo-Japanese War of 1904–5, when these inventions were in their infancy, it became noticeable that the volume of small arm fire, rendered possible by the magazine rifle and machine gun, when coupled with the extension of battle fronts—due to the increasing size of armies based on the principle of the nation in arms—increasingly led to the defensive becoming the stronger form of war. The result was the growth of trench or siege warfare.

In the next war—World War I—this tactical condition passed from a temporary on to a permanent footing, and to feed the great artillery battles the lorry rapidly replaced the horse-drawn ammunition wagon, and also the supply wagon, in order to sustain the masses of men trench warfare demanded. The failure of these battles to reinstate mobility led to the introduction of bullet-proof armour, which, when combined with the internal combustion engine and caterpillar track, resulted in the invention of the tank. By defeating bullet, trench, and entanglement the tank remobilised the older arms. Thus the first great revolution in warfare was

succeeded by the second: the lorry replaced the draught horse and the cavalry charger disappeared.

The war also witnessed a vast development in aircraft, which not only facilitated reconnaissance but showed that, because armies and fleets could be circumvented and military targets as well as the civil population in rear of them attacked, land and sea forces would increasingly lose their power to protect the nations to which they belonged: otherwise put, that even during mobile war siege warfare could be continued by vertical instead of horizontal bombardments delivered from bases hundreds of miles distant from the target. Thus was introduced spacial in contradistinction to surface warfare. At length the caterpillar of war had taken to wings and the age-old dream of Dædalus had become a reality.

Out of World War I emerged three tactical theories, and it is important to note that each shifted the traditional physical attack—the clash of arms—towards a psychological rather than a physical end—the clash of ideas.

At the Battle of Cambrai in November, 1917, casualties had been phenomenally low, not only because of the suddenness and comparative speed of the tank attack but also because it completely unhinged the German field command. What this pointed to was that, as an army cannot operate without a command any more than a body can without a brain, when feasible, to attack the command is more profitable than attacking the troops it controls. Thus, in theory at least, the aim of the attack—that is, the defeat of the enemy—was shifted from the physical to the moral field, the means being paralysation of the command—the power-house of ideas—in order to disorganise and demoralise the fighting body instead of destroying it.

At the same time a somewhat similar theory was propounded by airmen. Why, they asked, should you strike at either the bodies or brains of fighting forces when it is possible by means of aircraft to strike at the nerves and will of the civilian population behind them, and by shattering the civil morale create such disorder and panic within an enemy's country that its government will be paralysed? According to this theory, paralysation should be political instead of strategical.

Though the end visualised by the exponents of what later on became known as "strategic bombing" was sound enough, yet the history of war has time and again shown that the means proposed was psychologically defective. A loyal people cannot suddenly be dragooned into submission by terror, and even should large sections be disloyal, to deprive them of their homes and subsistence is more likely to compel them to depend on their government for their means of survival, and therefore accept its authority, than to stimulate their treachery.

What the exponents of strategic bombing could not see was that, as in the case of the introduction of the horse for warlike purposes, the primary influence of the aeroplane would also be logistical, and that by relieving the soldier of the necessity of depending upon surface communications, in this all other changes it might introduce would have their roots. Whereas the main characteristic of the tank was that it neutralised the bullet, the main characteristic of the aeroplane was that it dispensed with roads. Herein lay a revolution in mobility never before possible in war.

The third theory was propounded by Lenin. "The soundest strategy in war," he said, "is to postpone operations until the moral disintegration of the enemy renders the delivery of the mortal blow both possible and

easy." Therefore, in his system of warfare psychological took precedence over military attack and defence. His aptest pupil, Hitler, amplified his theory by saying: "The place of artillery preparation for frontal attack by the infantry in trench warfare will in future be taken by revolutionary propaganda, to break down the enemy psychologically before the armies begin to function at all. The enemy people must be demoralised and ready to capitulate, driven into moral passivity, before military action can even be thought of. . . . When the enemy is demoralised from within, when he stands on the brink of revolution, when social unrest threatens—that is the right moment. A single blow must destroy him. . . . A gigantic, all-destroying blow."

By the date Hitler had risen to power the radio had been so vastly developed that he was able to use it as psychological artillery, firing one kind of vocal shell to moralise the German people and another kind to demoralise their potential enemies. Be it noted, this also was strategic bombing, but in a psychological sense. It possessed extraordinary advantages over its aerial counterpart, for its fullest effect was obtainable during peacetime, and in wartime it could "hit" every human being on the globe without physical or material damage. Therefore, as Lenin had foreseen, propaganda was the ideal instrument whereby actual warfare could be fostered, stimulated, or prevented.

The pattern warfare took in World War II was largely shaped by these three theories. It was a war of astonishing mobility and destructiveness set within the framework of popular hysteria of a ferocity not witnessed in Europe since the Thirty Years War.

On land the attack by paralysation, carried out by tanks and aircraft in combination, proved again and again that its premises had been correctly determined. Poland was over-run in eighteen days and France in thirty-five. Of the second of these armoured assaults an eye-witness wrote: "The French General Staff have been paralysed by this unorthodox war of movement. The fluid conditions prevailing are not dealt with in the text books and the 1914 brains of the French Generals . . . are incapable of functioning in this new and astonishing lay-out." The same was to be seen in the Balkans, in Russia, and in North Africa, and though by 1944 anti-tank weapons had been multiplied and improved out of recognition, the same was witnessed in General Patton's remarkable break-through and advance on Paris in the late summer of that year.

In contradistinction to this most modern form of land warfare, the most primitive—namely, guerrilla warfare—was introduced on a vast scale. This was due not only to the defeat of regular armies but was the logical outcome of total war, which demands total effort springing from both sources of mobility, the mechanical and the muscular, the one highly organized and the other largely improvised. During the war the latter was stimulated and controlled by the radio and supplied by the aeroplane; hence the rapid growth of resistance movements.

Whereas the aim of organized warfare is to overcome or resist strength, that of guerrilla is to exploit weakness; to terrorise the enemy's lines of communication and rear services, and to draw his organized forces away from the localities in which strength demands they should be concentrated. At sea this type of war is known as *guerre de course*, in which to-day the submarine replaces the guerrilla; a form of naval warfare which in

both world wars all but brought Great Britain to ruin, and which, like guerrilla warfare, is brutal because quarter is seldom asked for or given.

The second theory—strategic bombing—was first put to the test by the British at the time of the fall of France, and from then, and later on in conjunction with the Americans, it became the main allied means in the reduction of German resistance. Nevertheless, vertical bombardments, though they effected enormous damage, proved to be as slow a process of shattering the German civil will as the horizontal bombardments of World War I had been in shattering the German military will. In the Pacific the strategic bombing of Japan culminated in the dropping of the first two atomic bombs, yet all they showed was that the destructive effect of a bomb releasing nuclear energy was equivalent to several hundreds or thousands loaded with T.N.T. and napalm (jellied petrol), which had wrought even greater havoc at Tokyo. The atomic bomb in no way revolutionised war; what it did was to add enormously to its destructiveness.

It was not, however, as an independent weapon—as fighter or bomber—that the aeroplane displayed its most revolutionary powers. It was, as the bombing theorists should have foreseen, that it turned space into a road for all kinds of traffic—strategical, tactical, and administrative. Norway was largely reduced by paratroops; Crete was conquered by airborne forces; and the campaigns in the Pacific and Burma would have been impracticable without transport aircraft. In Burma over 1,180,000 tons of supplies and 1,380,000 troops were transported by air.

At sea, because the air-carried bomb vastly outranges the gun-fired shell, the aircraft-carrier, hitherto an adjunct to a fleet, replaced the battleship as the capital ship. Battles were opened at ranges of hundreds of miles and frequently, as in those of the Coral Sea and Midway Island, were won and lost without a single surface vessel exchanging a shot.

Throughout the war the influence of air power was so all-embracing that it obscured the fact that, as in the past, sea power still dominated land power. It was sea power which halted Hitler's westerly advance in 1940, for it was the command of the English Channel, guaranteed by the British Home Fleet and Fighter Command, which secured Great Britain against invasion. It was sea power which from start to finish enabled the Allied Powers to draw on the resources of the entire world outside the enemy countries, and in consequence sustain themselves during the war. It was sea power, British and American, that forced Hitler to over-extend his land forces by occupying hundreds of miles of coast lines in order to deny his enemies points of landing. It was sea power which kept the Russians in the field and enabled the British and Americans to transport vast armies over the oceans and seas and land them at localities which, on account of the above over-extension, inadequate German forces could be concentrated to repel them. Finally, it was loss of sea power by the Japanese, and not the atomic bomb, which forced them to accept unconditional surrender.

Overseas invasions, which in former wars were considered so difficult that they were seldom attempted, were vastly simplified by the introduction of amphibian tanks and tractors, rocket-firing ships and a large variety of landing craft. In all probability these new means of invasion were the most far-reaching tactical innovation of the war, for they enabled what had hitherto been impossible, the launching of a land attack from the sea in tactical order.

Though the most astonishing inventions were developed in the field of electronics, such as radar and guided missiles, it was the radio which, by dominating the war psychologically, gave to it its character. Therefore, it was the third theory—Lenin's—which played the leading part. No sooner had the war opened than truth was assassinated, and from then on a continuous flood of lies, half-truths, falsifications, and exaggerations in scores of languages deluged the inhabitants of the world. Psychologically humanity was proletarianised—that is, reduced to a dead level of credulity, imbecility, and ferocity. Worse still, those who were responsible for this subversion fell victims to their own propaganda.

Nevertheless, as an instrument of policy propaganda was less skilfully used than it had been in World War I. Whereas in that conflict President Woodrow Wilson's "Fourteen Points" drove a psychological wedge between the leaders of his enemies and their peoples, which split them asunder and shortened the war, President Roosevelt's "Unconditional Surrender" delayed the collapse of Italy and rendered German resistance fanatical, as also did the publication of the Morgenthau Plan. Not only did these psychological blunders lengthen the war but they directly led to the establishment of Russian autocracy over nearly the whole of Eastern Europe and much of Central as well. Thus, through psychological ineptitude the peace was politically lost by the Anglo-American Powers.

It was, however, during the years immediately following the physical conclusion of the war that the most remarkable development in the psychological pattern of future warfare is to be seen. Though the war of shot and shell was over, the war of words and ideas was rigorously continued by Russia and directed against all non-communist countries, and in particular those of her wartime allies. Within five years this bloodless war enabled the Soviet Union to establish an ideological empire covering nearly a third of the land surface of the globe and including forty per cent. of its inhabitants, a conquest unequalled in history.

Thus we arrive at two patterns of warfare as instruments of policy: the one facilitating the gaining of the political end by subversion, and the other by destruction. The first, to be effective, demands that the lever of propaganda should work from an inflexible fulcrum, represented by a fixed policy or creed, as does that of Russia, whose political aim is positive—the creation of a new economic and social world order, and not merely the destruction of the old: The strength of the second lies in its armaments, in the popular mind symbolized by the atomic bomb, the most destructive of them all. Its political aim is, however, negative; it is to destroy rather than to create.

In an industrial civilisation, which depends for its well-being on the economic expenditure of energy, psychological warfare is incomparably less costly and wasteful than physical. Further, the destructiveness of physical warfare is now so all-embracing that military victory is meaningless, for it leads to conditions which make not only industrial civilisation but any form of civilised life impossible. Therefore the physical pattern of war, though still an expression of industrial civilisation, is increasingly becoming antagonistic to its continuance.

The "wardom" which now embraces the world revolves between these two patterns of warfare. The psychological is now in full activity and the physical is steadily being prepared for. Therefore the question "Is war

inevitable?" is meaningless, for to-day the world *is* at war. What is cogent is, will psychological war give way to physical?

The answer would appear to be "Yes," because Russia's psychological attack is meeting with so little opposition that to halt it her enemies will resort to physical war, or should their preparations to wage it become formidable, Russia will resort to a "preventive" war before they are completed. In either case, what will the final pattern be?

That the next war will open on traditional lines—that is, by a clash between armies, fleets, and air forces—is possible. But what would seem more probable is that from the start propaganda will take command and by dementing the nations unleash a war of annihilation. In the Hun and Mongol invasions of the Middle Ages vast stretches of Europe were depopulated, and between 1550 and 1650, during the wars of religion and the Thirty Years War, the population of what between 1871 and 1918 was the German Empire was reduced from twenty-one to about thirteen and a half millions; in Bohemia alone the population sank from two million to seven hundred thousand.

Again, in a hidden way it will be an anti-population war, a conflict of mutual genocide blindly urged on by the biological cause of war in order to break the over-population blockade, which is at the bottom of the world unrest. The means of accomplishing this have and are continuing to be so greatly perfected that it is not even possible to guess at the extent of the destruction which will be wrought. Not only is it probable that atomic bombs, radioactive poisoning and bacteriological warfare will be resorted to, but that guerrilla warfare will be universal; that liquidations and counter-liquidations of whole social and political sections will take place; and that people will again be herded by millions from one country into another to make room for their victors, and ultimately, if not wanted, will be exterminated as war criminals.

Though these possibilities are hypothetical, one thing is certain. The world population cannot indefinitely go on increasing at the rate of twenty millions and more a year without a world-wide calamity. Man must eat to live, and if he cannot eat he will fight. Food is the great fundamental, and when lack of it is the cause of war, wars are annihilative.

J. F. C. FULLER

CHAPTER XI

THE ROYAL NAVY—ORGANISATION AND ADMINISTRATION

THE ADMINISTRATIVE and general policy control of the Royal Navy is exercised from the Admiralty, where it is in the hands of the Lords Commissioners for executing the office of Lord High Admiral. In olden days the Lord High Admiral was appointed by the Crown and was responsible to the Crown for the administrative efficiency and state of the Navy. But as the Navy grew, the office of Lord High Admiral became too burdensome for any one man, and his duties were administered by a Board of Commissioners representing the older appointment of Lord High Admiral. In a similar way, as the Parliamentary system grew in strength and responsibility, the Crown delegated its authority to Parliament. Yet the old traditional link with the Lord High Admiral and the Crown remains in the somewhat sonorous official title of the Board of Admiralty and in the designation of the ships which comprise the Royal Navy.

The Board of Admiralty consists of eleven members, and the composition as on April 1, 1951, is given on page 28.

The Board of Admiralty as a whole is responsible for policy within the structure of the Royal Navy, and the necessary link with the overall strategical policy of defence comes through the automatic appointment of the First Sea Lord as a member of the Chiefs of Staff Committee. Through this link the broad decisions on national and international strategy are brought before the Board and broken down into the departmental details required to implement the main policy decisions.

The Second, Third, Fourth, and Fifth Sea Lords have departmental responsibilities in respect of personnel, general administration, supplies, and Naval Aviation respectively. Each has a mixed Naval and civilian staff, so that the twin aspects of their departments, the impact on Naval and civilian life, are adequately covered. Overall responsibility to Parliament, particularly on the financial side, is in the hands of the First Lord, the Parliamentary Secretary, and the Civil Lord.

Beneath the Board's level, the Admiralty is divided into departments, those dealing with the purely Naval side, such as Operations, Intelligence, and so on, being under the general charge of the Vice-Chief of Naval Staff and the Assistant Chief, those on the civil side, Secretariat, Accounts, etc., being under the responsibility of the Permanent Secretary. The departments cover every aspect of Naval affairs and handle most of the day-to-day administrative detail of the Admiralty. Some departments are housed outside the Admiralty, such as that of the Engineer-in-Chief, at Bath, but come under the central administrative control from Whitehall.

COMMAND ORGANISATION

As in the other two defence Services, the Royal Navy is organised in Commands, of which there are eight at home and six overseas. Those at

home are the four main shore bases at The Nore, Portsmouth, Plymouth, and Scotland; the Naval Air Service with headquarters at Lee-on-Solent; submarines, based at Gosport; the Reserve Fleet; and, of course, the Home Fleet, based in time of peace at the home ports.

Each main Command is divided into a number of sub-Commands. In some administrative matters a practice has grown up in which the sub-Commands refer direct to the Admiralty, in others through the Commander-in-Chief. This is a matter at present within the jurisdiction of the local Commander-in-Chief, but a system is in process of being evolved whereby uniformity of treatment will be ensured through each Command.

The Commands overseas are Germany, America and West Indies, South Atlantic, Mediterranean, East Indies, and Far East. As at home, these have their sub-Commands in the areas administered by the Commander-in-Chief.

Commanders-in-Chief in all Commands, both at home and overseas, are kept in touch with the day-to-day running of their Command through a Naval staff, reporting through a Chief-of-Staff, usually of the rank of Captain. Certain sub-Commands, particularly Naval dockyards, report direct to the Commander-in-Chief. Long practice has built up a somewhat anomalous situation in connection with the running of the Naval dockyards, for while the local Commander-in-Chief bears general responsibility, administrative and technical control is exercised by the Engineer-in-Chief's Department, housed at Bath, but administered by the Admiralty. This divided control has worked harmoniously and efficiently and is unlikely to be superseded.

Of the fourteen Commands into which the Royal Navy is divided, three are functional and eleven geographical. Naval Aviation, Submarines, and the Reserve Fleet are the three functional Commands; for the remainder, the four home ports have strict geographical limits, and the Home Fleet and the six overseas Commands have well-defined areas of operational responsibility.

HOME COMMANDS

THE NORE

Commander-in-Chief : Admiral Sir Cecil Harcourt, K.C.B.

Sub-Commands : Royal Naval Dockyard, Chatham; Royal Naval Barracks, Chatham; Sheerness.

The Nore Command operates in the sea area bounded by a line from Dover to Calais in the south, and eastward from the Humber in the north. In time of peace there is little operational control at sea, apart from routine passages of ships to and from the dockyard, local exercises, and so on. A certain amount of specialist training for the Navy is carried out in the area, various technical schools being situated in the area of the Command.

PORTSMOUTH

Commander-in-Chief : Admiral Sir Arthur Power, G.C.B., C.B.E.

Sub-Commands : Royal Naval Dockyard, Portsmouth; Royal Naval Barracks, Portsmouth; Portland.

The limits of the Portsmouth Command extend across the English Channel from Dover in the east to Start Point in the west. Portsmouth, which is probably the most important of the home Commands, includes the Schools of Gunnery (H.M.S. Excellent), Torpedoes (H.M.S. Vernon), Navigation (H.M.S. Dryad), and Coastal Forces (H.M.S. Hornet). The sub-Command at Portland houses the Anti-Submarine School (H.M.S. Osprey), and is also the operational base of the Training Squadron. The Commander-in-Chief, Portsmouth, however, has no operational control over the Training Squadron, which is administered by the Commander-in-Chief, Home Fleet.

PLYMOUTH

Commander-in-Chief : Admiral Sir Rhoderick McGrigor, G.C.B., D.S.O., to be succeeded in November 1951 by Vice-Admiral M. J. Mansergh, C.B., C.B.E., D.S.O.

Sub-Commands : Royal Naval Dockyard, Devonport; Royal Naval Barracks, Devonport; Londonderry.

The Plymouth Command embraces the coastal area from Start Point to the Firth of Clyde, including the war-time Western Approaches Command. The Royal Naval Engineering Colleges at Manadon and Keyham are both situated in the Plymouth Command area, and there are other technical training centres in the vicinity of the dockyard.

SCOTLAND

Flag Officer, Scotland : Vice-Admiral Sir Angus Cunningham-Graham, K.B.E.

The operational area of the Scotland Command extends from the northern boundary of the Nore Command and the northern boundary of the Plymouth Command northabout round the Scottish coast. The dockyard at Rosyth is now on a care and maintenance basis, but the Command area includes the fleet anchorages at Scapa Flow, Loch Ewe, and other Scottish lochs on the west coast.

NAVAL AVIATION

Flag Officer (Air) (Home) : Admiral Sir Reginald Portal, K.C.B., D.S.C.

Sub-Commands : Flag Officer, Flying Training; Flag Officer, Ground Training; R.N. Barracks, Lee-on-Solent.

The Naval Air Service has its headquarters at Lee-on-Solent with sub-Commands at Donibristle, Fife (Flying Training); at Lee-on-Solent (Ground Training); and at Arbroath, Angus (Reserve Aircraft). The Flag Officer Commanding is responsible for the operational activity of Naval aircraft based on shore aerodromes, for all training of flying and observer personnel, for maintenance and repair of Naval aircraft, and for the administration of the Naval Air Service. Operational control of carrier-based aircraft is vested in the Commanders-in-Chief of the various fleets which contain carrier squadrons.

HOME FLEET

Commander-in-Chief : Admiral Sir Philip Vian, K.C.B., K.B.E., D.S.O.
Sub-Commands : Training Squadron, 2nd Cruiser Squadron; 3rd Aircraft Carrier Squadron.

The Home Fleet consists of those units which are fully operational in the waters surrounding the British Isles, with a few exceptions where operational vessels are maintained by the home commands. A major exception is submarines, which is a separate Command. This is because submarines, by their nature, do not work with the fleet, an attempt to make them do so shortly after the 1914-18 War (the K-class) ending in failure, and indeed disaster.

Ships of the Home Fleet are normally based in peace-time on the ports from which they are manned, being assembled from time to time for fleet training and exercises. They are administered wholly by the Commander-in-Chief, who is responsible to the Board of Admiralty.

The Training Squadron, although under the command of the Commander-in-Chief, Home Fleet, is not fully operational, in some cases guns, mountings, and other armament being temporarily removed to provide additional accommodation for training classes. In an emergency, however, it could be quickly brought to a state of full operational efficiency.

RESERVE FLEET

Flag Officer Commanding Reserve Fleet : Vice-Admiral Sir Henry W. U. McCall, K.C.B., D.S.O.

The Reserve Fleet consists of vessels reduced to reserve, *i.e.* manned by skeleton crews for maintenance, upkeep, and occasional passages at sea, and those permanently laid up, which are subject only to routine inspections. The Command is an extensive one, not only in the number of vessels concerned but also in their location, ships being laid up in several ports round the coasts. Many of the vessels permanently laid up have had their machinery, armament, and fittings specially protected by "mothball" methods to prevent damage by exposure to the weather.

SUBMARINES

Flag Officer, Submarines : Rear Admiral S. M. Raw, C.B., C.B.E.

The Submarine Command has its headquarters at Fort Blockhouse, Gosport. It embraces all the operational submarines in the British Isles, and is also responsible for the technical administration and operational requirements, as distinct from operation patrols and passages, of submarines on foreign stations.

A close liaison exists between the staff of the Flag Officer, Submarines, and the research departments of the Admiralty. This is necessarily so because of the great volume of current research which is being put into present-day submarine development. A similar close liaison exists with the Anti-Submarine School at Portland.

The Flag Officer, Submarines, is also responsible for the administration of the training submarines and the selection and training of submarine officers and crews.

OVERSEAS COMMANDS

GERMANY

Flag Officer, Germany : Rear-Admiral G. W. G. Simpson, C.B., C.B.E. to be relieved in October, 1951, by Rear-Admiral R. St. V. Sherbrooke, V.C.

The Naval Command in Germany is part of the Allied Forces of Occupation. With headquarters at Kiel, the Command is responsible for the Naval disarmament of Germany and the dismantling of dockyard facilities, mine clearance in German waters, and general administration of the Naval forces of occupation. The Flag Officer, Germany, is also the Chief British Naval Representative in the Allied Control Commission.

MEDITERRANEAN

Commander-in-Chief : Admiral Sir John Edleston, K.C.B.

Sub-Commands : 1st Cruiser Squadron ; Mediterranean Fleet Destroyers ; Malta ; Middle East ; Gibraltar.

The Mediterranean Fleet is the largest and most important of the overseas Commands. Its operational area covers the whole of the Mediterranean Sea, its eastern approaches—Red Sea, Persian Gulf, etc.—and its western approaches to Gibraltar.

Its main role is the defence of British interests in the Mediterranean, especially the Empire trade routes through the Suez Canal. The main fleet base in the area is at Malta. There are Naval dockyards at Malta and Gibraltar, which both come under the administration of the Commander-in-Chief.

The interests of the United States in the Mediterranean, especially in Greece and Turkey and in parts of Cyrenaica, have compelled that country to keep a strong task force in those waters since the war. By thus spreading the responsibility this has, to some extent, reduced the necessity for keeping so powerful a British force in these waters as in the past. A close liaison exists between the two Fleets, and frequent combined exercises make them well able to operate together under a single command should the occasion arise.

AMERICA AND WEST INDIES

Commander-in-Chief : Vice-Admiral Sir William Andrewes, K.B.E., C.B., D.S.O.

The America and West Indies station extends from the Western Atlantic and Caribbean Sea southward along the coast of South America. The main base of the squadron in this station is at Jamaica.

The role of the America and West Indies station has gradually been changing with the growth of the United States as a naval power. It is now chiefly of value for "showing the Flag" cruises to South American Republics and for the creation of goodwill. It also protects British colonial interests in its large area.

Its only sub-Command, which was Bermuda with its small Naval dockyard, was closed down earlier in the year as an economy measure.

SOUTH ATLANTIC

Commander-in-Chief : Vice-Admiral Sir Herbert A. Packer, K.C.B., C.B.E.

Sub-Command : Simonstown.

The main base of the South Atlantic squadron is at Freetown, and the area of the Command is bounded on the north by the southern limit of the Gibraltar sub-Command of the Mediterranean area, and on the west by the eastern limit of the America and West Indies Station. The area of the Command extends to the waters around South Africa and into the South Indian Ocean. The Naval base and dockyard at Simonstown is included in the South Atlantic Station.

EAST INDIES

Commander-in-Chief : Vice-Admiral Sir Geoffrey N. Oliver, K.C.B., D.S.O.

Sub-Command : Ceylon.

The strategic importance of the East Indies Command has grown with the emergence of India as an independent republic with Dominion status, of Pakistan and Ceylon as Dominions, and with the break-away of Burma from the Empire. This has, in some respects, created a power vacuum in the Indian Ocean, altering the traditional British Naval role in these waters.

One of the main responsibilities of the Commander-in-Chief is to build up an efficient liaison between the British squadron on the East Indies station, the Indian and Pakistan Navies, and the Cingalese Navy, and to foster a general co-operation between them.

FAR EAST

Commander-in-Chief : Vice-Admiral the Hon. Sir Guy Russell, K.C.B., C.B.E., D.S.O.

Sub-Commands : 5th Cruiser Squadron; Hong Kong; Malaya.

The outbreak of war in Korea has focused attention on the Far East Station during recent months, and the ships there have been placed on a full war footing during hostilities. As a result, there has been a heavy concentration of the Far East Fleet in the northern half of the station, the the remaining area being somewhat denuded of vessels. Ships of the Far East Fleet are temporarily based on Kure, in Japan, during the Korean hostilities.

Normally the China squadron is based on Hong Kong, with a flotilla of smaller craft at Singapore. The main peace-time duties of the China Squadron are the protection of British interests at Hong Kong and Malaya, the suppression of piracy in those waters, the supply of British Consulates up the main Chinese rivers, and showing the flag at Chinese and Japanese ports.

As in the Mediterranean, strong American Naval forces are based in these waters and a close understanding exists between the ships of the two nations.

RESERVES

Admiral Commanding Reserves : Vice-Admiral W. R. Slayter, C.B., D.S.O., D.S.C.

There are three main classes of reservists in the Navy. They are the Royal Fleet Reserve, which consists of time-expired men from the Royal Navy who volunteer for a period in the reserves; the Royal Naval Reserve, composed of volunteers from the Merchant Navy who put in a recognised period of training in the Royal Navy at certain periods; and the Royal Naval Volunteer Reserve, a voluntary force of men who train in their spare time, similar in many respects to the Territorial Army.

Recruitment into the Royal Naval Reserve, for some years abandoned after the war for economy reasons, has recently been restarted. Registrars are appointed at all ports in the United Kingdom who forward names of volunteers.

The Royal Naval Volunteer Reserve is organised in divisions with headquarters in the London, Sussex, Solent, Severn, Mersey, Humber, Tyne, Forth, Clyde, Tay, Ulster, and South Wales areas. In addition there are three R.N.V.R. air squadrons, based on the Naval air stations at Lee-on-Solent and Ford.

The Royal Naval Volunteer Supplementary Reserve is an off-shoot of the R.N.V.R. and is composed of men with some sea or specialist knowledge, such as yachtsmen, etc., and their periods of training differ from those of the R.N.V.R. They are affiliated to the same Divisions as the R.N.V.R.

In addition to the three main classes of reserves, there are two pre-service training organisations. The Royal Naval Volunteer Cadet Corps has centres at Chatham, Portsmouth, and Devonport; and the Sea Cadet Corps, a volunteer youth corps, has units in most large towns. The Lord Commissioners of the Admiralty delegate their authority over the Sea Cadet Corps to a Sea Cadet Council, which is administered by the Navy League.

THE ROYAL MARINES

Commandant-General : General Sir Leslie Hollis, K.C.B., K.B.E., C.B.
Sub-Commands : Plymouth Group; Portsmouth Group.

The Royal Marines are administered by their Headquarters in Queen Anne's Mansions, London, which in turn comes under the general control of the Admiralty.

The chief sub-Commands have recently been reduced from three to two by the closing down of the Chatham Group. That at Plymouth is commanded by Major-General J. E. Leech-Porter, C.B., C.B.E., and the Portsmouth Group is under the command of Major-General H. T. Tollemache, C.B.E.

In addition to providing detachments for ships of the Royal Navy of the size of cruiser and above, the Royal Marines now furnish the personnel of the Commandos. These, when employed on active service, come under the operational control of the area commander, irrespective of service or, nowadays, of nationality. Their training in peace-time is mainly directed by the Headquarters of Amphibious Warfare, in itself largely staffed

by Royal Marine personnel, and carried out in the main sub-Command areas.

Reserves for the Royal Marines are organised in the Royal Marine Forces Volunteer Reserve, a force under similar training commitments as for the Royal Naval Volunteer Reserve. There are R.M.F.V.R. centres in the City of London, Bristol, Merseyside, Glasgow, and Portsmouth areas.

Pre-service training is carried out in the Royal Marine Volunteer Cadet Corps, with centres at Chatham, Portsmouth, Plymouth, and Deal.

WOMEN'S ROYAL NAVAL SERVICE

Commandant : Miss M. K. Lloyd, O.B.E.

Like the other two Services, a women's section of the Royal Navy has been organised. It is administered from Headquarters in Queen Anne's Mansions, under the control of the Admiralty. It provides much of the clerical staff in shore establishments, etc.

NORTH AMERICAN TREATY ORGANISATION

The merging of Western Union into the North American Treaty Organisation has, to a certain extent, brought the ships of the Royal Navy based in home waters under the operational control of S.H.A.P.E. (Supreme Headquarters Allied Powers Europe). Admiral André Lemonnier, of France, is the Deputy Supreme Allied Commander of the N.A.T.O. Naval forces under General Eisenhower, and Admiral Sir Patrick Brind, G.B.E., K.C.B., has been appointed Commander-in-Chief, Northern Area, and will also act as Commander of the Allied Naval Forces.

ANCILLARY SERVICES

A number of civilian ancillary services for the Navy are maintained and are under the control of the Admiralty and/or Ministry of Supply. The chief of these are the Royal Corps of Naval Constructors and the Royal Naval Scientific Service, whose duties are directed by the Board of Admiralty in those directions most requisite for the Naval service.

P. K. KEMP

CHAPTER XII

FOREIGN NAVIES

THE YEAR 1950 has been dominated in the Naval world by two events of far-reaching significance. The first was the outbreak of war in Korea and its corollary, the taking up of arms by the United Nations in resistance to aggression. The second was the more vivid realisation, stressed by the events in Korea, of the threat to Western democratic ideals inherent in the present temper of Communist imperialism and the rapid increase of Russian rearmament. This striking division of the world into two clearly defined armed camps has inevitably applied a spur to the leisurely post-war plans of Naval development, and for the moment a general all-round increase in Naval strength has taken the place of the previous emphasis on research into the effects of new weapons.

This is not to suggest that research into the new weapons has in any way been postponed. Last year, as in all the years since 1945, the tendency in Naval development was to await the outcome of current and projected research before proceeding with any major new building. The present crisis has reversed that tendency and there has been a decided impetus throughout the world to lay down new Naval vessels and, presumably, to hope that they will not be overtaken during building by those new weapons which are still in the research stage.

A fair amount of progress has been made in the development of the three new weapons which are certain to revolutionise Naval warfare—the fast submarine, the guided missile, and the atomic bomb. The first two are mainly tactical weapons from the Naval point of view, and the third until recently was purely strategical and thus more of academic than operational interest to most Navies. Recent reports, however, show that current development is bringing atomic energy into the region of tactical weapons, and as such it is bound to have a vital influence on Naval design. The original bomb of some four-and-a-half tons in weight needed a specially designed heavy bomber to carry and deliver it. A newer and smaller, though little less destructive, version can, it is reported, be carried by a fighter-bomber, and it is also being adapted for use as the warhead of a guided missile. The trend of development is obvious, and the time may not be so long delayed before torpedoes, and even shells, are charged with this destructive material.

Russia still remains something of an enigma in the Naval world, and the ultimate design of her Navy is still not clear. Information from behind the Iron Curtain is both difficult to obtain and frequently unreliable when reports do leak out, but there seems good reason to believe that the rapid increase, almost universally forecasted, in her submarine fleet has not been realised. This is fully understandable if Russia, like other maritime nations, is alive to the potentialities of the fast submarine. This may not be so far in the future as had at one time been thought, for nuclear propulsion is under active trial in the United States, and the Walther closed circuit engine is probably beginning to emerge from the

experimental stage. To await the results of these two new developments before committing resources to building is obviously wise. That may well be one reason why the Russian submarine programme is lagging behind the planned output; another is that the planned construction was almost certainly above existing shipyard capacity. It would, indeed, be folly to build large numbers now if, within a year or two, all existing submarines were to become obsolete.

The smaller Navies of the world, having exhausted the supply of surplus vessels belonging to the major powers after the war, have for the most part been content with what they had acquired. A small amount of new building has been going on in some countries, and within the last few months the larger budget proposals for 1951 have resulted in more orders being placed for new craft. In the main, however, these have been for small vessels, and only in the United States are major warships being built. The rate of completion of vessels still on the stocks is still comparatively slow, even with the added international tension as an incentive to speed up existing building.

UNITED STATES

The original sum voted for the United States Navy for the fiscal year 1951 (July 1–June 30) amounted to \$4,448,181,000, but this was increased during the year by supplementary votes which raised the total to \$6,723,080,000. This additional sum was required to “re-activate” vessels from the “moth-ball” fleet and to lay down, among other ships, a new large fleet carrier of 57,000 tons. All told, the additional appropriation was to cover the laying down of 173 new vessels and the conversion of 291 others.

The total defence budget for the fiscal year 1952 is the immense figure of \$57,604,234,390. From their share of this, in addition to the new building projected and under construction, the Navy will maintain an active fleet of 1,161 ships, with an average strength of 790,000 men. This number does not include the Marine Corps, whose strength will be 192,000 officers and men, with two and a half divisions ready for service in the field. These figures are a little more than double those authorised for 1951 and are a measure of the earnestness with which the United States is facing the task of rearmament.

The international situation has been responsible for the recall of General Marshall to active politics. He has relieved Mr. Louis Johnson as Secretary of Defence. Mr. Francis Matthews remains as Secretary of the Navy. At the time of going to press the name of the new Chief of Naval Operations, to replace Admiral Forrest Sherman, who died suddenly in July, has not been announced. The other main commands in the American Fleet are held by Admiral William Fechteler (Atlantic), Admiral A. W. Radford (Pacific), Admiral R. B. Carney (Eastern Atlantic and Mediterranean), Vice-Admiral Matthias B. Gardner (United States Sixth Fleet, Mediterranean), and Vice-Admiral C. T. Joy (Far East).

The large increases in strength of the various American fleets, and operational needs in the Pacific, have had their effect on the number of bases maintained during the year. The station on Midway Island, closed at the end of June 1950 as an economy measure, was reopened in August

as a result of the Korean war. The leased base at Trinidad, British West Indies, which had been placed on a reduced status in May, was also restored to full capacity later in the year. The United States bases in Newfoundland, which were formerly in operation only for military air transport purposes, became a major oversea command. Work continued throughout the year on the fleet base being constructed in the Aleutian Islands, and this must by now be nearing completion.

In spite of the rapid Naval rearmament programme, with its immense calls on available manpower, research still occupies a major place in all American Naval planning. Once again the main volume of research has been directed into the development of the fast submarine, anti-submarine warfare, and guided missiles.

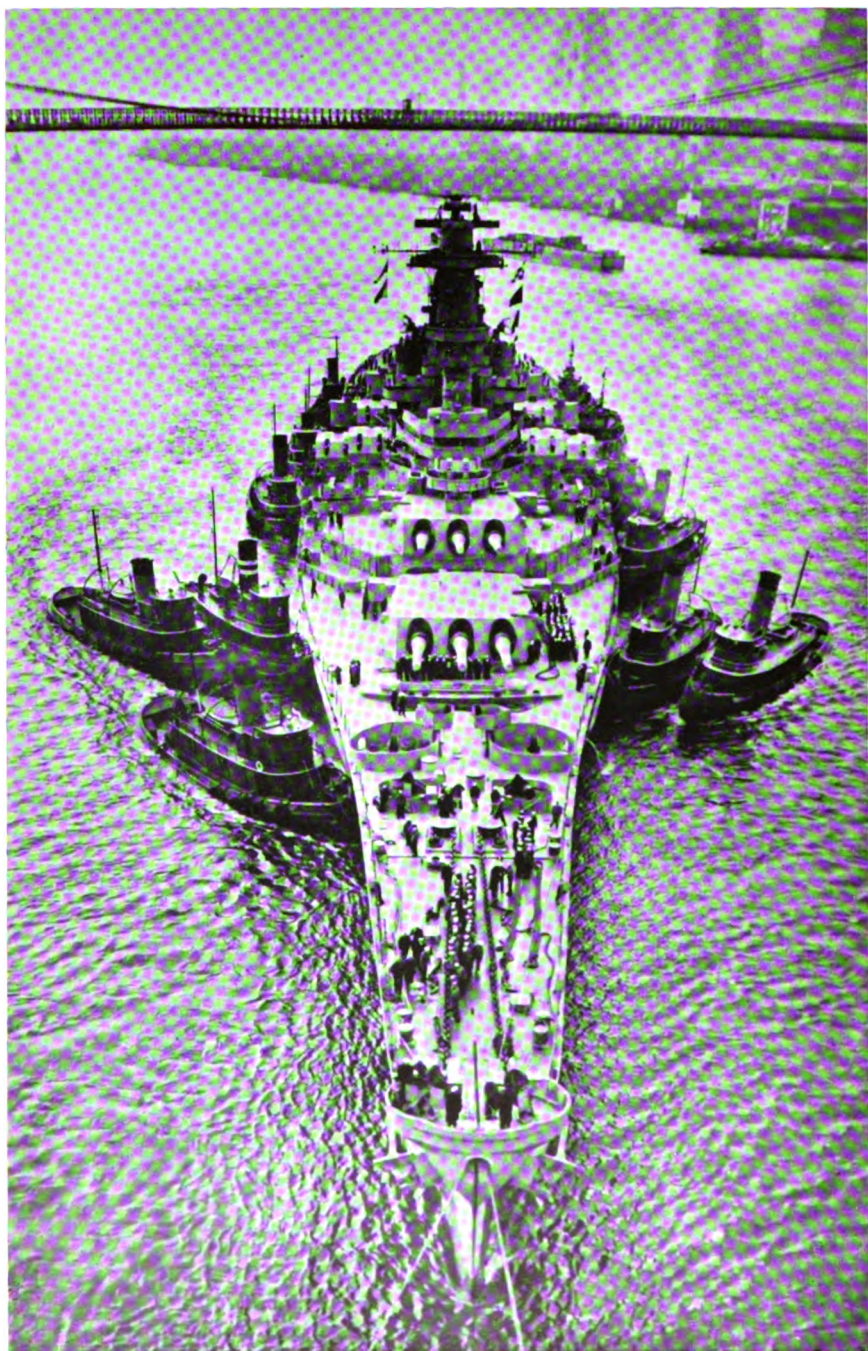
Of the first, the most promising line at the moment would appear to be that in which a nuclear reactor is being fitted in a new submarine. The contract for the reactor was placed with the Westinghouse Electric Corporation last year, but the project is obviously still only in the early development stage at present and must be regarded as a long-term commitment, in spite of a statement by Senator Magnuson, chairman of the Senate merchant marine committee, that atomic-powered submarines, capable of speeds of up to 60 miles an hour, would join the United States Fleet within a year. That statement would appear to be unduly optimistic as to both speed and time. No reports of progress as to the other method of fast propulsion, the hydrogen-peroxide engine, have been received from the United States, the rate of development being a matter covered by security, but tests have been going on for some time in the Annapolis experimental station and it is reasonable to assume that further progress has been made during the last year. The Trigger, whose keel was laid early in 1949, was the first of a class of four in which, it was stated, hydrogen-peroxide engines were to be fitted, but it does not appear that she is in commission yet.

The more immediate plans for procuring high underwater speeds, the "Guppy" programme, have been speeded up during the last year and several more boats have been taken in hand for conversion. The "Guppy," of course, is no more than a development of the German Type XXI U-boat, consisting of extensive streamlining of the hull, more powerful batteries and motors, and a Schnorkel tube.

Progress in anti-submarine measures, if unspectacular, has been steady. Considerable research is being done in all major navies to extend the range of Asdic detection, and this applies to the United States as much as to Great Britain, France, and Russia. Although the bogey of the Russian submarine menace has not been raised in America recently with so much force as in previous years, it still retains its effect in Congressional circles and has continued to give a note of urgency to the research programme. More sensitive radar installations in aircraft, designed to pick up an echo from the top of a Schnorkel tube; the use of Sonobuoys to broadcast submerged propeller noises; the development of an anti-submarine submarine with some type of homing or Asdic-controlled torpedo; further development in the accuracy and destructive power of depth-charges, squids, and hedgehogs; and a weapon still on the secret list which has been tried out with considerable success; all these have been under active development during the past year. Early in 1951 a



An American 155-mm. Howitzer, with its team, in action in Korea



U.S.S. New Jersey recommissions at New York

bill introduced by Representative Vinson, chairman of the House Armed Services Committee, called for the conversion of 194 destroyers for modern anti-submarine warfare and these, in combination with the long-range Neptune aircraft fitted for submarine detection, will undoubtedly form an impressive and powerful deterrent against large-scale submarine warfare.

Finally, in the range of new weapons comes the guided missile. Development has been rapid during the last year, and the rocket-powered guided missile is being increasingly used as a normal fleet offensive weapon. The number of surface ships and submarines fitted to fire these missiles is growing rapidly, and two submarines were used recently to fire "loons"—15,000-lb. missiles—for the First Task Fleet to shoot at in "anti-rocket" exercises. Two more cruisers from the "moth-ball" fleet are to be converted for the launching of guided missiles during the 1951 programme, and others are expected to follow as the efficiency and ease of control of the new weapon grows.

A new aerial combat rocket named the "Mighty Mouse" has been successfully developed and tried by the Naval Air Arm. It is reported to be small enough to be carried in considerable quantity in fighters, yet fast and powerful enough to destroy any known plane with a direct hit. According to the Department of Defence, it has a considerably greater range and speed than any rocket developed during the war and may be fired singly or in salvos from the wing or fuselage on an airplane.

Admiral Sherman, in a report to Congress in April, stated that there were in active service three battleships, twenty-seven aircraft carriers, fifteen cruisers, and 209 destroyers, apart from submarines and smaller vessels. Since then, of course, many more ships have been put into service, some of them new ships completed, others taken from reserve and re-commissioned. The figures announced show a large increase compared with a year ago.

Considerable attention has been paid during the last twelve months to the problem of minesweeping, and a large number of the smaller craft under construction are sweepers of a new design. New types of mines have called for new techniques and designs in minesweepers, and the importance of mining has sprung rapidly into prominence during the past year. The loss of three minesweepers in Korean waters has given an added incentive to the building programme, which is now being treated as a matter of urgency.

The year has seen the normal fleet exercise programme carried out, except in the Pacific where the Korean war has produced active service conditions with little time for manœuvres. A large-scale combined exercise, in conjunction with the British Home and Mediterranean Fleets, was carried out by the United States Sixth Fleet in the Mediterranean, bringing together the largest concentration of warships assembled in those waters since the 1939-45 war. Vice-Admiral John J. Ballentine commanded the United States Naval forces. Other exercises have been held in the Caribbean Sea area and in the northern waters of the Atlantic.

A rather more extensive programme of atomic experiments than usual has been carried out at the Eniwetok testing ground and in Nevada. It has been reported that the weapons tested have been of considerably greater power than those previously used and that many anti-atomic lessons have been learned. The old carrier *Independence*, which was

extensively damaged at the original series of tests at Bikini and which had been used since then as an atomic research ship, has been towed out from San Francisco and sunk.

BATTLESHIPS

A year ago the United States Navy, like the British, had no battleship in full operational commission, the Missouri having been reduced to a training status. Since then she has resumed an active service role and has been employed in Korean waters for bombardment purposes in support of the United Nations ground forces. The New Jersey has been brought out of reserve, recommissioned, and has been in action in Korean waters. The Wisconsin has been "re-activated" and is now fully operational, while the fourth ship of this class, the Iowa, has been brought forward to a state of immediate reserve.

The Missouri took the ground during a passage last year, remaining fast aground for just over three weeks. When refloated she went into dock for examination, but only superficial damage was found.

The Kentucky, the fifth battleship of the 'Iowa' class, is still 70 per cent. complete and is laid up in the Navy Yard at Norfolk, Va. No work is being done on her, but she may not be scrapped without the approval of Congress or the House Armed Services Committee. The battlecruiser Hawaii, 82 per cent. complete, is also laid up under a similar proviso. This is the vessel which was to be completed with rocket projectors in place of her original 12-inch guns. It is unlikely now that she will ever be completed.

AIRCRAFT CARRIERS

The House Armed Services Committee approved in January the building of a new carrier of 57,000 tons of modified flush-deck design, with a small control island offset. She is to be named the James V. Forrestal, in honour of the late Secretary of Defence, who had also served as Secretary of the Navy. The selection of this name brings an odd twist to the history of the outsize carrier. Plans for a former one, of 60,000 tons and to be called the United States, were approved two years ago when Mr. Forrestal was Secretary of Defence. They were cancelled by his successor, Mr. Louis Johnson, on representations from the Air Force, with which Mr. Johnson was in sympathy, and the tragic circumstances of Mr. Forrestal's subsequent death were widely connected with his disappointment over this cancellation. Mr. Johnson, in his turn, was succeeded by General Marshall as Secretary of Defence, and the decision about the large carrier has again been reversed. The choice of name for the proposed vessel is at once a vindication of Mr. Forrestal's foresight and a tribute to a much-loved and selfless servant of the United States Navy. It has been stated that the new carrier will take three and a half years to build.

Since last year the active carrier strength of the United States Navy has been increased by twelve, of which three are fleet carriers. Among those brought forward from reserve are, it has been reported, the Princeton and Hornet (fleet), the Monterey, Bonhomme Richard, and Los Angeles (light fleet), and the Cape Esperance, Sitkoh Bay, Bairoko, and Kula Gulf (escort). The modernisation of the 'Essex' class, to include larger lifts, more powerful catapults, increased stowage for aircraft and a stronger flight deck to operate larger aircraft and modern jet fighters,

has been carried forward vigorously, and six further vessels of that class are being taken in hand during the year. The Oriskany, Essex, and Wasp have already been modernised. After modernisation all will be able to handle the new Neptune medium bomber and even larger aircraft.

The carrier Long Island, formerly the Mormacmail, has been converted back into a merchant ship and sold to the Caribbean Land and Shipping Co.

CRUISERS

The cruiser strength of the United States Fleet has been brought up to a total of fifteen by "reactivating" two from the "mothball" fleet, of which one is reported to be the heavy cruiser Macon. Twelve more cruisers are to be taken in hand for modernisation and conversion for anti-aircraft protection, and one heavy cruiser of the 13,700-ton 'Oregon City' class is to be adapted for the launching of guided missiles, at a cost of over \$40,000,000.

There has been no intimation of the progress of the two anti-submarine "hunter-killers," the Norfolk and her yet unnamed sister, which were both authorised in 1947. The Norfolk is expected to be completed during 1951, but construction of her sister ship was deferred in 1949 and it is not certain whether she is still in being. It has been reported that this class of ship, an anti-submarine vessel of cruiser size and novel type, will embody new devices and weapons and that the final cost will be about \$40,000,000 per ship.

Also still building is the Northampton, a cruiser of 13,000 tons. She was laid down in 1944 and was to have been one of the 'Oregon City' class, but was cancelled in 1945 when 57 per cent. completed. She was re-ordered in 1948 and re-designed for completion as a Task Force Command Ship, accommodation and equipment being modified accordingly. It is expected that her completion date will be about mid-1952.

DESTROYERS, SUBMARINES, ETC.

The four long-range fleet destroyers, Mark A. Mitscher, John S. McKain, Willis A. Lee, and Wilkinson, are due for completion this year and early 1952. Their tonnage is reported as 3,675 tons (4,400 tons full load) and they are thus almost what the other navies would call light cruisers. The other new destroyer building, the Timmerman, has not yet been reported as operational. She is, it is thought, being fitted with some sort of gas turbine transmission, and presumably will need a long period of trials to eliminate teething troubles in the new power plant.

The conversion of existing destroyers in the "mothball" fleet for anti-submarine duties continues apace, 194 being taken in hand this year. At the same time thirty-two destroyers are being "reactivated," bringing the active strength of the United States Navy in this class of vessel up to a total of 172.

The submarine programme is headed by four projected vessels, for which funds were requested in April. They are an atomic-powered submarine with a displacement of 2,500 tons, for which the Electric Boat Corporation are building the hull and Westinghouse Electric Corporation the nuclear reactor. The cost of this vessel is estimated to be \$40,000,000. The second of the projected submarines is a hydrogen peroxide (closed

cycle propulsion) craft of 2,200 tons, to cost approximately \$37,000,000. The third is a high-speed underwater target and experimental submarine of 1,100 tons, to cost \$10,000,000, and the fourth an experimental coastal submarine of 250 tons, for which \$3,000,000 is being allocated.

Still building are the six high-speed attack boats of the 'Tang' class. These boats displace 1,600 tons, similar to the Balao, Tench, and Corsair classes of fleet submarines, but are shorter in overall length, being 260 feet as compared with 311 feet. They are reported as likely to be the fastest submarines in the world, with speeds of over fifteen knots submerged and over twenty knots on the surface. They are streamlined, deep-diving vessels fitted with Schnorkels. Also still building are the three "submarine killers." These are boats of about 750 tons and an overall length of 195 feet, but details of their armament and equipment are still unknown.

The "Guppy" programme is being accelerated, ten more fleet type boats being taken in hand for streamlining, installation of larger batteries and motors, and Schnorkel tubes.

The Cusk and Carbonero, both originally of the 'Balao' class, have been fitted as guided missile submarines. The "loon," which is the type of missile they launch, weighs 15,000 lb., is contained in a watertight steel hangar, and takes off from a ramp fixed to the submarine's deck. The Burrfish, Requin, Spinax, and Tigrone have been converted to Radar Picket submarines, the Grouper to a large submarine-killer, the Perch and Sealion to submersible troop transport, the Guavina to an oil-carrying submarine, and the Barbaro to a cargo-carrying submarine.

The Pickerel, one of the "Guppy" boats, made a passage from Hong Kong to Pearl Harbour, 5,200 miles, without surfacing. She dived off Hong Kong on March 15, 1951, and surfaced at Pearl Harbour on April 5.

Amongst smaller craft, for the building of which authorisation has been given by Congress, are fifty-two minesweepers and six landing ships. The full building programme of auxiliary vessels for 1951 amounts to 112 ships of different classes.

The hospital ship Benevolence was rammed and sunk in thick fog on the night of August 25, 1950, off San Francisco by the cargo ship Mary Luckenbach. One nurse and seventeen men lost their lives. The minesweepers Magpie, Pirate, and Pledge have been sunk by mines off Korea with heavy loss of life.

NAVAL AVIATION

The sharp reduction in air strength announced early last year as an economy measure was reversed with the outbreak of war in Korea. Naval aviation, instead of facing a deficiency of 530 in operational requirements as envisaged a year ago, is now to be increased by a further 1,100 planes.

The most important trials in 1949 were those in which Neptune medium bombers had been successfully launched from the flight deck of a carrier. During the year under review trials have been successfully carried out for the reverse process, and on October 26 the United States Navy announced that big aircraft, capable of conveying atomic bombs, had landed on an aircraft carrier at sea for the first time. They were AJ-1 attack bombers, weighing over seventeen tons and with a speed of 350 m.p.h. A squadron of unloaded AJ-1s made separate landings on the carrier Coral Sea off Virginia Capes during exercises.

On February 8 a twin-engined Neptune bomber of the United States Navy set up a new distance record for carrier-based aircraft. It was launched off the Florida coast and, with a crew of seven, flew 5,060 miles before landing at San Francisco. It was in the air for 25 hours 59 minutes.

Continued research in the field of aircraft electronics has been directed towards the production of more sensitive search radar. One of the main difficulties in modern anti-submarine warfare is to distinguish, on a radar screen, the difference between "sea returns" and the top of a Schnoekel tube. It is reported that this has now been achieved in the most recent aircraft sets.

FRANCE

Vice-Admiral Lambert was appointed Chief of Naval Staff on August 9, 1950, in succession to Vice-Admiral Battet, who died last year. Admiral Lambert was formerly in command of the Mediterranean station.

The Jean Bart, a battleship of 35,000 tons, was completed during the early part of 1951 and in April sailed on a shake-down cruise before joining the Mediterranean Squadron at Toulon. She had been held up last year for her anti-aircraft guns and radar installation. She did 32.4 knots on her speed trials, a very satisfactory figure considering they were carried out in a fresh wind and heavy sea.

The United States carrier Langley has been transferred to France under the Mutual Defence Assistance Programme. She is in place of the projected carrier Clemenceau, of 15,000 tons, on which building was halted after her keel had been laid. It is not certain yet that the Clemenceau will finally be abandoned, proposals having been put forward that the modern French Navy should be built round a nucleus of four carriers. No decision has yet been taken, but it seems more probable that the 15,000 tons provided for the Clemenceau will be considered for an additional tonnage of destroyers.

The 8,000-ton cruiser De Grasse, whose building has been held up for technical and financial reasons, is still waiting for new designs of her armament. It has been reported that she will in all probability be completed as an anti-aircraft cruiser.

The most interesting new vessels in the recent building programme are the two types of destroyers laid down, known as *escorteurs rapides* and *escorteurs océaniques*. Four of each type have been ordered. The *escorteurs rapides* are of 2,700 tons (nearly 4,000 tons full load). They have geared turbines producing 63,000 s.h.p. with a designed speed of 34 knots. Designed mainly as anti-aircraft vessels, they are armed with six 5-inch anti-aircraft guns in three twin turrets, six 57-mm. Bofors in twin turrets, some lesser guns, probably 20-mm., and four torpedo tubes in a quadruple mounting. They also carry some anti-submarine devices.

The *escorteurs océaniques* are anti-submarine vessels. They are of 1,500 tons and are fitted with Diesel engines to give them a speed of 26 knots. They carry one 105-mm. gun in the stern, four 57-mm. Bofors in twin mounts, and an extensive anti-submarine armament, including new devices. Four destroyer escorts have been transferred to the French Navy from the United States. They are the Arabe (ex-Samuel S. Miles), Kabyle (ex-Riddle), Bambara (ex-Sweaver), and Sagalave (ex-Wingfield).

The frigate Laplace (ex-United States Roanoke) was lost by an

accidental internal explosion during September 1950 while at anchor off St. Malo. There was considerable loss of life. Salvage proved to be impossible, and the wrecked hull was finally blown up as she lay on the bottom.

Four new submarines of 1,500 tons, authorised under the 1949 and 1950 programmes, are under construction, but no details of the type of machinery to be fitted in them have been made public.

The aircraft carrier Dixmude has been used during the past year to ferry aircraft from the United States to France under the terms of the programme for military aid to Western Europe. It is probable that this would be her main role in an emergency, as she can hardly be classed as an operational vessel in modern conditions.

RUSSIA

The Supreme Soviet recently adopted the national budget report, under which the Russian Navy is to get 15,000,000,000 roubles (equivalent to £1,340,000,000) out of a total defence estimate of 79,400,000,000 roubles.

The Soviet Navy still remains much of an enigma and it is getting more and more difficult to obtain reliable information of Naval events from that country. Reports from other Baltic countries are frequently contradictory, and are no more helpful than the Russian propaganda broadcasts, which are normally too boastful to be taken seriously.

No further reports of the new battleships have been received than those detailed in "Brassey's Annual" last year. The tonnage, reported then as 35,800, would seem to be an understatement if the dimensions, variously reported as $794\frac{2}{3} \times 119 \times 29\frac{1}{2}$, and $859\frac{1}{2} \times 131\frac{1}{4} \times 32\frac{3}{4}$, are correct. The former set of figures should give an approximate tonnage of about 45,000, the latter one of about 60,000, or even more. A draught of $32\frac{3}{4}$ feet seems a little unlikely for Baltic waters, and the first set of figures looks the more likely of the two. Although five distinct names have been mentioned, Sovietskaia Byelorossiia, Strana Sovietov, Sovietski Soyuz, Stalinskaya Konstitutzia, and Rossiya, it appears fairly certain that only three ships are involved. Of these, it seems equally certain that one is now fully operational, having completed her trials, a second launched at Leningrad in March 1950, and the third, slightly larger than the other two, still on the stocks in Leningrad.

It is presumed that the two old battleships Gangut and Sevastopol have been reduced to little more than floating anti-aircraft defences. Their anti-aircraft armament is reported to have been recently increased. Both were built in 1911 and could have little operational value now, even in Baltic waters. The ex-Italian battleship Giulio Cesare has been renamed Novorossiisk after being refitted and rearmed with the Russian 12-inch guns.

The situation in regard to the new "improved Kirov" cruisers is equally uncertain. Two of them, the Tchkalov and Tchapyayev are in commission, the Zhelesnyakov should by now be complete, and a fourth about ready for launching. The state of the other two is not known. Their reported displacement is 9,500 tons, and their armament consists of twelve 7.1-inch guns in triple turrets, ten 4-inch anti-aircraft guns, and six

smaller anti-aircraft. The ex-Italian cruiser Emanuele Filiberto Duca D'Aosta has been renamed Stalingrad.

The six new destroyers of the 'O' class, reported as building or completing last year, should now be in service. Others of that class have been laid down. A slightly smaller destroyer, provisionally named Stalin, has been observed under construction.

The Russian submarine fleet is still the cause of considerable apprehension among Naval powers, and there can be no doubt that it is a formidable force. The latest figure reported is 380, with a minimum of 120 more in various stages of construction. It should be realised, however, that the Russian submarines are widely spread, the majority (135) being in the Baltic, 110 in the Far East, 40 in the Black Sea, and 30 in the White Sea. Of these totals, over 100 are coastal submarines, and over 40 are standard German war-time boats which must be approaching the end of their useful operational life.

In general, the Russian underwater fleet, so far as modern construction is concerned, consists of four types. The improved K class are boats of 1,500 tons, streamlined and fitted with Schnorkels. The second type is a fast minelaying boat, with a reported underwater speed of 25 knots. Doubtless this is an exaggeration. The other two general types are the German Types XXI and XXIII. It would be of considerable interest to know the progress made with the Type XXIII, a project in which all Navies have a deep interest.

The following frigates, lent to Russia during the war, have been returned to the United States during the past year—Albuquerque, Bayonne, Bisbee, Burlington, Evansville, Everett, Glendale, Gloucester, Gallup, Hoquiam, Newport, Sausalito, and Tacoma. A request for the return of over 200 other small craft supplied to Russia under Lease-Lend terms has been refused on the grounds that the United States does not need these vessels.

Recent Russian Naval moves in the Baltic have caused some apprehension and anger in Sweden and Denmark. Fishing boats have been arrested outside the three-mile limit, and on occasions outside the twelve-mile limit which Russia unilaterally claims as her territorial waters. It is possible that Sweden and Denmark may be forced to claim an equal limit in the case of Russian ships by way of reprisal. Another Baltic move is the suggestion, put forward in the periodical *State and Right*, that the Baltic should be closed to all men-of-war not belonging to the Navies of Baltic Sea powers. This suggestion has met with no favourable response outside Russia and her satellite countries.

ITALY

There have been no reports as to the progress of the six large destroyers authorised under the 1950 programme. They are to be fitted with special anti-submarine devices and with an improved anti-aircraft armament. In the meantime the Italian Navy is being strengthened by the addition of eight destroyer escorts from the United States. The first three have already been handed over at Taranto. They are the 'Captain' class vessels Gandy, Thornhill, and Wesson. These boats did excellent service during the 1939-45 war and are to be found in several Navies.

The tall funnel steamboats had a speed of 29 knots, but the short-funnel diesel variety could do no more than 21 knots at full speed.

The destroyer *Granatiere* has been taken in hand for conversion as a high-speed anti-submarine frigate. Her forward 4.7-inch gun is being removed and a hedgehog fitted in its place on the forecastle. She now has a 4.7-inch gun amidships and twin 4.7-inch aft.

The three ex-German minesweepers B1, B2, and B3, acquired in 1949, have been renamed *Antilope*, *Diano*, and *Gazzella*. They are coal-burning boats of 600 tons and, after being refitted, have been classified as corvettes.

A new escort vessel, with a speed of 30 knots, is projected as an experimental unit. No details of armament or method of propulsion have yet been announced.

A Naval commission of British, American, French, Dutch, and Italian officers visited Trieste in December 1950 to establish the possibility of building destroyers and minesweepers for early delivery to the Atlantic Treaty nations. The Adriatic shipyards comprise yards in Trieste and Monfalcone, but the former is debarred from use under the terms of the peace treaty providing for the demilitarisation of the Free Territory. Monfalcone, however, was used extensively before the war in the building of the Italian Fleet and has turned out warships from battleships to submarines. It is a modern yard, well equipped, and should be capable of making a useful contribution to the building facilities of the N.A.T.O. powers.

OTHER EUROPEAN COUNTRIES

BELGIUM

The *Artevelde*, seized by the Germans in 1940 and recovered at Cuxhaven after the war, is being converted into an anti-aircraft ship and equipped to serve as an escort. She should be completed this year. The four fleet minesweepers acquired from Great Britain during the past year are the *Fancy*, *Ready*, *Rosario*, and *Spanker*. They are in addition to the *Adrien de Gerlache* (ex-*Liberty*) and *Georges Lecointe* (ex-*Cadmus*).

DENMARK

The Danish defence forces have been merged into a single command, with one Commander-in-Chief in overall direction of the unified force.

The frigate *Galathea* has left Denmark on a voyage of deep-sea exploration round the world which is expected to continue into 1952. The object of the expedition is to investigate the fauna at the greatest ocean depths, as much as 6,500 fathoms. The *Galathea* has been fitted with special implements designed by Danish scientists for these investigations.

GREECE

The Royal Hellenic Navy, already considerably strengthened by the acquisition of six modified 'Hunt' class destroyers, now classed as frigates, from Great Britain, is also to receive six destroyers from the United States. No names have yet been reported, but it is expected that they will be 'Captain' class destroyer escorts.

The ancient cruiser *Averoff*, which for so many years has headed the official list of the Royal Hellenic Navy, has at last given way to the ex-Italian cruiser *Eugenio di Savoia*, and it can be assumed that she is no longer operational. It is probable that she will now be scrapped.

NETHERLANDS

Some considerable indignation has been caused in Holland by reports from the United States that the Royal Netherlands Navy was to be curtailed in connection with the integration of the Naval forces belonging to the North Atlantic Treaty powers. The proposal has, apparently, been dropped in the face of a vigorous protest by Rear-Admiral H. C. W. Moorman, the Dutch Under-Secretary of State for the Navy.

The two new cruisers building have exchanged names. When Queen Juliana launched the second ship in August 1950 she was given the name of *De Zeven Provinciën*, already given to her sister ship, which has now been re-named *De Ruyter*. The expected date of completion of the new vessel is 1953.

Six American escort destroyers, classed in Holland as frigates, are being acquired. The first two are the *Van Amstel* (ex-Burrows) and the *De Bitter* (ex-Rinehart) and they were handed over at Boston in June 1950, the first to be transferred to a foreign government under the Mutual Defence Assistance Programme. The remaining four will be named *Dubois*, *Van Ewijck*, *De Zeeuw*, and *Van Zijll*, believed to be ex-Eisner, Gustafson, O'Neill, and Stern respectively. They are of 1,250 tons displacement with diesel-electric engines giving a speed of 21 knots, and are armed with three 3-inch dual-purpose guns, six 40-mm. anti-aircraft guns, and several smaller anti-aircraft pieces.

Four new submarines are projected for completion in 1954. Two are to be built by Rotterdam Drydock Company and two by Wilton-Fijenoord, Schiedam, but no details of size or speed have yet been made public.

The work of extending the Naval base at Den Helder has been continued vigorously during the year, some £2,500,000 being spent during 1950. The entire project is expected to take eight years to complete.

Two squadrons of Naval aircraft from the carrier *Karel Doorman* have been based in Great Britain for training and for practice in operating from British carriers.

NORWAY

Completion of the *Aalesund* has been delayed because of her re-designing. She was laid down at Horten in 1939, but was damaged by sabotage during the war, a sister ship being completely destroyed. She is a destroyer of 1,220 tons and her main armament is four 4·7-inch guns, a twin mounting forward and two single mountings superimposed aft, with four 21-inch torpedoes in pairs amidships. She also carries four anti-aircraft guns. Her designed speed is 39 knots.

PORTUGAL

Much of the Portuguese Navy exercised with the British Home Fleet during its passage from Gibraltar to Lisbon. Among vessels taking part

were the destroyers Vouga and Dao, and the frigate Diego Gomez. The results of the exercises were reported by Admiral Sir Philip Vian, Commander-in-Chief Home Fleet, as most encouraging.

SPAIN

The 10,670-ton cruiser Canarias, taken in hand last year for modernisation, is now back in service. She has a somewhat odd appearance, as her foremast has been removed. The catapult has also been taken out and she now carries no aircraft.

There is still no information as to the progress of the nine 'Oquendo' class destroyers, ordered in 1947, or the second of the two 'Alava' class, laid down in 1946. The Alava herself was launched in 1947, but her sister, named Liniers, is still believed to be on the stocks. In addition to these, nine small destroyers of the 'Audaz' class are under construction at Ferrol. Six of them were laid down in 1945 but have not yet been completed.

Four submarines of the 'G' class, based on the German 750-ton U-boat design, are under construction at Cartagena. A fifth submarine of this class was the former U-573, which was interned in Spain in 1942 and purchased the following year. Seven new minesweepers are also building.

SWEDEN

Four new destroyers of an improved Oland design have been authorised, of which two, the Halland and Smaland, are under construction. As originally planned, they will be of 2,550 tons displacement and will carry four 5-inch anti-aircraft guns and eight 21-inch torpedoes. They are being fitted for minelaying and, if they follow normal Swedish practice, will have very high speeds, probably 36 or 37 knots. The two old destroyers Ehrensköld and Nordenskjöld have been taken in hand for conversion into fast anti-submarine frigates.

The four submarine chasers being built under the 1950 programme are still under construction, and a new motor-torpedo-boat of experimental design has been reported as almost completed.

Three new sea-going submarines of 800 tons each, to be named Hagen, Salen, and Valen, are in the building stage. They will be fitted with Schnorkels and will have fast-diving capabilities. It has been reported that the submarines Sjöborren, Sjöhästen, and Sjöhunden have been fitted with Schnorkels and streamlined according to the "Guppy" design. Two minesweepers are also under construction.

TURKEY

Two more of the United States 1,526-ton class submarines have been handed over during 1950, to make the total now six. The new ones are ex-Blower and ex-Bumper, but their new names in the Turkish Navy have not yet been announced. The rescue ship Bluebird is also to be transferred. The hulk Gulcernal is now being broken up.

YUGOSLAVIA

It has been reported that the two small sister ships of the ex-Italian *Ariete*, salvaged by the Yugoslavs at Fiume, are approaching completion. They are the ex-Italian *Balestra* and ex-Italian *Fionda*. It is understood that, like the *Ariete*, they will retain their former names. They are all small destroyers of 800 tons armed with two 3·9-inch guns.

New construction consists of the destroyer *Split*, of 1,875 tons, and of two sister ships which have not yet been given names. They are designed to carry five 5·5-inch guns and six 21·7-inch torpedoes in triple mountings. They are to have a speed of 37 knots. Also building are three to six small submarines of 500 tons, under the supervision of German engineers. A report that Yugoslavia had acquired two large and four medium submarines from the Soviet Navy should be treated with reserve in view of the strained relations between that country and the Cominform. The ex-Italian *Nautilo* has been reported raised and refitting in a Yugoslav yard.

AMERICAN COUNTRIES

ARGENTINA

A report from the United States has stated that two light cruisers will be handed over to Argentina. They will be withdrawn from the "moth-ball" fleet and restored to full operational condition by the United States Navy. The date of transfer is expected to be late 1951.

BRAZIL

An agreement has been signed with the United States for the acquisition of two light cruisers on similar terms to those entered into with Argentina. The names of the two ships selected for transfer have not yet been made public.

CHILE

An agreement similar to those with Argentina and Brazil has been signed with the United States for the acquisition of two light cruisers. A report states that the American cruisers *Brooklyn* and *Savannah* have been purchased for \$8,000,000. This may refer to the agreement mentioned above. The new names have not been officially reported, though they are believed to be *Esmerelda* and *O'Higgins*.

A Chilean Naval expedition left Valparaiso in December 1950 to establish a third base in British Antarctic territory. This was in contradiction of the agreement signed in November by Great Britain, Argentina, and Chile.

PERU

Two gunboats for the Peruvian Navy, the *Ucayali* and the *Maranon*, have been built at Thornycroft's Yard, Southampton. They are shallow-draught gunboats of 350 tons displacement for service on the River Amazon and its tributaries.

VENEZUELA

Messrs. Vickers-Armstrongs have received an order from the Venezuelan Government for two new destroyers to be built at Barrow. No details as to size or armament have yet been made public.

OTHER COUNTRIES

BURMA

The infant Navy of Burma has acquired some more small craft since mention was made of it in "Brassey's Annual" last year. Eight motor launches, of which five are on loan from the Royal Navy, are now included, as well as eleven motor gunboats, converted from N.D.M.Ls. Two river gunboats, the Saban and Shwepazun, have been acquired. They are converted inland water transport passenger craft.

CHINA

The Naval situation in China is still extremely confused, with the Navy divided between the Nationalist and Communist factions. So far as it is possible to trace the movements of individual ships, the Nationalists would seem to possess seven destroyers (ex-Japanese and in very bad condition), twenty-one destroyer escorts, one sloop, twenty-two gunboats, nineteen patrol vessels, eighteen motor launches, two L.S.Ts., and several L.C.Is. The Communists have control of four destroyer escorts, seventeen gunboats, one minesweeper, three motor gunboats, twelve patrol vessels, and various auxiliary craft.

It has been reported from the United States that an increased rate of military assistance is likely to be authorised for the Nationalist side, and it is probable that this will include Naval vessels.

The destroyer escort Chang Chih was reported sunk by Nationalist fighter-bombers in the Yangtse River, above Nanking, after deserting to the Communist cause.

EGYPT

In all, seven frigates have now been transferred to Egypt from the Royal Navy after refit in this country. They are the Mallow (renamed El Sudan), Mendip (Momahed Ali el Kebir), Whimbrel (El Malek Farouq), Usk (Abikir), Nith (Domiat), Spey (Rachid), and Cottesmore (Ibrahim el Awal). Two ex-United States frigates, ex-Papua and ex-Tobago, have also been acquired. They had served with the Royal Navy as 'Colony' class frigates under the Lease-Lend Act, but were returned to the United States Navy after the war. They were originally purchased by Egypt as passenger vessels, but are believed to have been refitted as anti-aircraft frigates.

SOUTH KOREA

A new addition to the Navies of the world is that of South Korea. The start was the purchase, in September 1949, of the former United States Merchant Marine Academy's training ship Ensign Whitehead by the

7,500 officers and men of the South Korean Navy. She was fitted with guns at Pearl Harbour in January 1950 and renamed Bak du San. She is a patrol craft with an overall length of 175 feet. Three further patrol craft were subsequently acquired.

As the war developed the United States transferred two frigates recently received back from Russia. These are the Rockford and Muskogee, renamed Dumankang and Apnokkang respectively. Some thirty other small vessels have been acquired, including a few former United States minesweepers and ten former Japanese minelayers.

The Commander-in-Chief of the South Korean Navy is Admiral Sohn Won Yil.

P. K. KEMP

CHAPTER XIII

* COMBINED OPERATIONS—BLACK ART OR COMMON PRACTICE?

IN A free and peace-loving country or community the first reaction after a war is to settle down to peace. The Armed Forces, together with the vast specialised industrial machine which has supported them, are forgotten, and the elected representatives of the people, assembled in Parliament, embark upon the setting up of the welfare or Utopian State, the war to end all wars having apparently come to an end. The risk (of insecurity) is thought to be so small that the annual premium in the shape of the Service Estimates is pruned and pruned again.

The Service chiefs are faced with the necessity of cutting their individual coats to match their cloth—or, more accurately, the cloth that they are allowed. What can be more natural than their reaction, which is to concentrate on their own somewhat specialised requirements? No peacetime sailor wants to go to sea in a ship with the characteristic blunt bows needed by the only class of ship that can embark and land a modern tank or one of the specialised monster vehicles required by the Royal Air Force if it is to operate effectively. The fact that the same specialised vehicle may one day direct the night fighter which will destroy the bomber trying to attack the Fleet (while the tank protects the vehicle) does not have a very direct appeal. To keep clear of the accusation of bias, it must be made clear that the cap fits the other Services almost as well. Given the choice between a long-range heavy bomber and a very long range reconnaissance aircraft fitted for anti-submarine work, there must be few airmen who would hesitate; they would scarcely be found in the Royal Air Force if they did. The choice offered to the enthusiast of the Royal Armoured Corps differs little—a super tank which is bound to win the land battle (assuming it reaches its operational zone) or the lighter and handier wading tank that can be put ashore quickly and in large numbers. The judgment of each and every Service is upset by the endless struggle with the bogey of finance. It is probably true to say that this affects the Royal Navy most, since its more obvious contribution towards inter-Service co-operation is the transportation (in ships and craft of specialised types that cannot be of great Naval value) of the standard Army and Air Force equipment, the use of which can be properly practised without the complications of embarkation.

It is with this background of ceaseless bidding in the Estimates market for better appropriations, and of making-do and improvising within their own departments, that the three Services view the vexed question of amphibious warfare—or combined operations, to use the more usual British phrase.

No doubt it is repeating a truism to say that virtually every war in history has included a combined operation on a more or less major scale. Nelson himself fought in as many incidents involving the use of land

(* Renamed "Amphibious Warfare" in June, 1951.—*Ed.*)

forces as he did in purely Naval battles. Nevertheless, the outset of every war has found both sides untrained and unprepared for such operations. It is equally true that at the end of every war it has seemed perfectly obvious that such operations are most unlikely to be repeated—modern developments, particularly in the art of defence, having rendered them apparently quite impracticable.

Can there, then, be any future for amphibious warfare? Is there any object in keeping in being the outline or skeleton of Combined Operations Headquarters, in having a School of Combined Operations, or in holding a reserve of specialised ships and craft? Apparently not; yet in Korea amphibious operations, both in attack and in retirement have played a not unimportant part. Without any question it was more than a little fortunate that in 1945 large numbers of unwanted Combined Operations ships and craft were lent to the Japanese authorities to enable them to restart their vital coastal traffic; in 1950 the specialised ships and craft were on hand. In the absence of any serious challenge to the command of the sea and air, no doubt the planning and execution of the operations presented little difficulty, and in any case there were still officers and men serving who had had first-hand experience of this type of warfare. So once again we started a war without being prepared for at least one of the forms it inevitably takes, and were very soon involved in that very form.

Before going further it might be as well to summarise shortly and perhaps too simply the advance of science in so far as it affects war in our time and the immediately foreseeable future. Clearly the atomic bomb, with its one mile radius of practically complete destruction, is with us. Its cost both in money and, which is more important in war, in economic effort will always be enormous, and so it will only be available in comparatively limited numbers and these will be kept for the really critical targets.

The 600-m.p.h. aircraft has reached the production stage and can now operate outside the effective range of warning radar, though it may soon be vulnerable to some form of pilotless though controlled projectile.

Finally, we must be ready to face the fast "true" submarine which is scarcely worried by asdics but is still by no means independent of the human element, whether the latter be directing the strategy and tactics or actually manning the craft during the long and trying underwater cruises.

The effects of these three developments on the complex problem of landing military forces on enemy-held coasts in no way differs from their effects on the more stereotyped operations of war. The atomic threat will naturally dictate dispersion, which should be no more difficult off the landing beaches than anywhere else in the theatre or, for that matter, the world; indeed, if we are properly equipped and educated the absence of fixed harbour and port installations can be made to prove a real advantage. The interception of the fast bomber is no more of a problem over the beachhead than it is likely to be over London itself, and if the fast submarine cannot be driven off the routes of the invasion convoys it is unlikely to be kept off the far more vital supply routes. In fact, modern developments, particularly the atomic threat, tend to add to rather than detract from the necessity for being prepared to handle cargoes over the beaches. Admiral of the Fleet Lord Cunningham of Hyndhope pointed out in his 1951 presidential address to the Institution of Naval Architects

that the atomic bomb may well be used to blot out our main docks and ports. He went on to say that unless we are ready to improvise large-scale port working over the beaches at the very outset of a new war, we shall starve.

Finally, before we dismiss as impossible the launching of an invasion force in the face of modern defences, we must always remember that our primary enemy in such ventures is no more powerful than he has always been. The vagaries of tides and moons, the unpredictable subsoil of the beaches, and the effects of wind and sea have not changed through the ages and will still provide the major threat to each and every seaborne landing. Seamanship and sea sense born of vast experience have overcome these difficulties in the past, and modern developments most certainly help rather than hinder. Superior seamanship will again play the major rule in the future, though few will not admit that there are grounds for disquiet in the very limited amount of sea-time that is available to the modern Naval officer after the age of 30.

It seems reasonably clear from what has been said that the ability to plan and execute amphibious operations must remain for some time to come a necessary qualification for the Armed Forces of the Crown. It must therefore be decided what can and cannot be done in time of peace to keep the technique alive, and we must ensure that the services themselves and the armament factories of the country are fully conscious of the implications.

Broadly, there are two schools of thought. The first takes the view that no special steps are necessary, since inter-Service co-operation is already adequately stressed, and that the material provisions can be made after the outbreak of hostilities when the shape of things to come is more clearly defined. The second points with genuine concern to the past and considers that, unless a special organisation is actually maintained, it is inevitable that the gaps will widen and will only have to be closed again under stress of emergency, at great cost and probably with much heart-burning and delay. How are these two schools of thought to be reconciled to-day?

We ended the 1939-45 war with a tremendous organisation which had, through necessity born of earlier improvidence, grown up to deal with the specialised materials and specialised problems of amphibious warfare. Originally formed to co-ordinate, and at one time actually to control, raids on enemy held coasts, it became what really amounted to a self-contained Service ministry. That it had no independent financial estimates was unimportant in war-time, when industrial capacity rather than the depth of the tax-payers' pockets was the limiting factor. Questions of training, production and experimental methods were thrust upon it simply because the other ministries were too busy with their individual tasks. To meet the urgent calls of the war as it took shape—and it became one great combined operation involving the transport and maintenance of large forces in territory which had been overrun by the enemy and left without effective ports and harbours—Combined Operations Headquarters found itself responsible for many things which might far better have been handled by the older parent ministries. Often accused of empire-building and of interference with the normal channels of command, Combined Operations Headquarters had a thankless task, which it

repeatedly tried to break down and hand back in detail. One instance will suffice: special training establishments were set up to turn out quickly the large numbers of officers and men needed to man the fleets of landing craft and landing ships that emerged from nearly every Allied waterway that flowed to the sea; this in itself was obviously undesirable, since it added immensely to the overheads of both manpower and money and produced a less highly trained corps of Naval officers and men who were not fitted for general service afloat. Their disposal in the theatres of operations after the assault, and after the not unlikely loss of their craft, became a constant source of embarrassment and irritation to the theatre commanders. This is, of course, a purely Naval matter, but similar troubles arose in each of the Services.

After demobilisation the future of C.O.H.Q., as it will always be affectionately called by many, was soon in the balance. History was not slow in repeating itself, and the Service Estimates came into the limelight. The traditional calls on the limited funds available threatened to strangle the much-maligned war baby.

Materially the decisions were relatively easy to arrive at, and in most cases were a matter for the Admiralty alone. Landing ships and craft are, by the very nature of things, not built to last. Often designed for particular jobs on particular beaches their retention would have been foolish in the extreme. Some of the latest types, built and often not completed in time for the Far Eastern theatre, were worth keeping in reserve in spite of the very considerable cost in men and materials. These are still available and in the aggregate are capable of lifting perhaps a Brigade Group. Some are out on charter to civilian firms for coastal trade, and one or two, which might be called prototypes, are in commission and are available at home and in the Mediterranean for cadre training, experimental and demonstration purposes.

Also on the material side, an experimental section has been kept in being. This is not large, nor need it be, since peace-time service is unlikely to produce anything very startling in the way of material changes. Apart from keeping a really first-class system of filing and registration thoroughly up-to-date, the most important function of the experimental section can be carried out in the drawing office. Every sort of new equipment which may be used in a seaborne landing must be watched carefully through the design stages to ensure that it is capable of being transported by sea, either in a landing craft or in the ships of the Merchant Navy. When the prototype is available it must undergo embarkation and wading trials from the appropriate landing ship or craft. The scope of this very important work must be widened to include the equipment of all Allied Powers, since inter-changeability is essential if plans are to be flexible and economical.

Before discussing the more difficult questions of the manning and staff problems it may be convenient to explain very briefly the existing organisation.

The three Services in turn nominate an officer of major-general status to act as the Chief of the Combined Operations Staff, a title which has recently superseded the war-time one of Chief of Combined Operations. With his office in London, and served by a joint staff which includes other ranks to carry out the duties usually associated with the Civil Services in

the older ministries, this officer directs the activities and policy of four units, all of which are housed in one establishment at Fremington, North Devon. He has no direct financial responsibility and the establishments are under the disciplinary command and general administration of the appropriate Service commanders in whose areas Fremington lies. The units concerned are: The School of Combined Operations, the Combined Signal School, the Combined Operations Experimental Establishment, and the headquarters of the Combined Operations Bombardment Battery. In addition to exercising a direct policy control over these units C.O.C.O.S. is accredited in an advisory capacity to the Amphibious School at the Royal Marine Barracks, Eastney, where Royal Marines, who now amongst their other duties man the minor landing craft for the Royal Navy, are trained. For convenience small cadres of specially qualified men, e.g. Frogmen and special beach parties, are held at Eastney.

In the war days none could dispute the necessity if not the right of the Chief of Combined Operations to attend the meetings of the Chiefs of Staff, and to-day C.O.C.O.S. still has the right to ask to be present when items which he considers to be within his charter are down for discussion; to enable him to exercise this right he receives copies of all but the most highly secret Cabinet Office papers. In exactly the same way C.O.H.Q. was and still is represented in various Planning Committees.

Responsible as he is direct to the Minister of Defence, on whose vote the officers and men of C.O.H.Q. are borne, C.O.C.O.S. and his Chief of Staff are in a somewhat anomalous position and there is ample opportunity for misunderstanding; if an invitation to attend is not forthcoming when a subject of apparent relevance is to be discussed, their duties demand that they must ask to be present, and self-invited persons do not always receive the most cordial welcomes.

On the lower staff levels the position is not so embarrassing. Staff papers are received in the early draft stages from all three Service ministries and from the Ministry of Supply, and, often for the first time, are thus available to officers of the opposite services. This is peculiarly so in C.O.H.Q., since both officers and men of all the Services are fully integrated into the various staff sections and work together regardless of the colour of their uniform. It is this aspect of the work of C.O.H.Q. that probably bears the most fruit. Nowhere else do the three Services work so closely together and so directly under each other. It is common practice for officers to find themselves chiefly concerned with the ministry of another Service, and they necessarily learn their way about it, both on paper and in practice. Far too often, even to-day, proposals are made in one Service which are not acceptable to the others, and the fact that in London there is a Joint Staff which can point out these difficulties at a very early stage, and before the more formal machinery of the Cabinet offices comes into play, is without doubt of real value.

In addition to this inter-ministry liaison work, C.O.H.Q. directs the policy of the establishments at Fremington; but this must be classed as a luxury trade, since the teaching policy could, and perhaps should, be more easily handled by the local Commandant in consultation with the other schools with which he is in constant communication.

At Fremington, as has already been said, there are four units employed solely on Combined Operations business. The Experimental Establish-

ment is on a very small scale and its very important though not in times of peace extensive functions speak for themselves. The School of Combined Operations is, like the others, an inter-Service establishment, administered by the War Office and commanded by officers of brigadier status drawn from the three Services in turn, though in fact the Royal Air Force have not yet claimed their vacancy. Staffed by all three Services, and with a U.S. Marine Corps officer attached, the school caters for all ranks of officers in courses varying from forty-eight hours for senior officers to four or five weeks for junior regimental officers, normally before they have undergone the staff course of their own Service. A limited number of N.C.Os., usually from the Territorial Army, are accepted for a special course. The syllabus covers the staff and planning aspects of seaborne operations and includes full-scale and model demonstrations of a very high order. A particularly interesting full-scale model is that of the operations room and communications arrangements of a ship fitted as a floating headquarters for a joint force.

Alongside the School and sharing its facilities is the Combined Signal School, where officers and men of all three Services are classed together and undergo technical courses in the signal systems and procedures used between the Services. Finally, also at Fremington, we find the Battery Headquarters of the Combined Operations Bombardment Battery. This unit was formed during the war to provide a number of teams of Royal Artillery officers and men specially trained to observe and control Naval guns when used in support of ground troops. Ships likely to be employed on this duty carried one of these teams as part of their complement and found them quite indispensable. To-day the battery is kept in being on a very reduced establishment, but at least one complete team was serving afloat on foreign service even before the Korean war started, and another is held at the disposal of the Home Fleet. This battery provides perhaps the most complete example of inter-service co-operation in existence in peace-time.

It may be, and indeed it is to be hoped, that what has been outlined in this article already will have convinced the reader that we should keep the art of amphibious warfare well in the forefront of our peace-time training and that we have in being a reasonably practical and economical organisation to control that training. This may be so, and yet there is always a very strong undercurrent of criticism directed at the Combined Operations Organisation as it exists to-day, and in particular against C.O.H.Q. itself. This criticism comes from well-informed officers with very real responsibilities and with a very intimate knowledge of the difficulties of the last war, both before and after the establishment of the H.Q. It would indeed be foolish to dismiss their criticism as petty jealousy or as an expression of annoyance at seeing part of their own Parliamentary Estimates being doled out to be used by an independent body.

There is one feature of the present arrangements which gives rise to doubts which must be shared by the most ardent protagonist of the Combined Operations School of thought. If you set up an organisation to deal with a special subject, that subject is very liable to be treated as a black art and regarded as being outside the ken and daily duty of the ordinary man; in fact, its retention may do more harm than good. More and more it becomes obvious that the whole nation must inevitably be

drawn into the maelstrom of war when it comes: women replace men and the line between civil and military defence becomes less and less distinct; nearly every week we read of exercises in which considerable numbers of soldiers are brought in with their equipment to play a major part alongside and even under the orders of the civil authorities. Surely it should not be necessary to keep up special establishment merely to teach the Services to understand one another? Cannot the Imperial Defence College and the Joint Services Staff College do all that is required? The answer to the latter question is—no.

The time to bring the Services together is at the regimental officer stage, if not before. The Imperial Defence College and the Joint Staff College cannot deal with the numbers involved, and they necessarily deal with somewhat academic affairs, or more accurately with policy and strategy rather than with tactics. They will never be able to handle the vast number of officers who will, or may, never have to write a complicated operation order but must be able to understand the outlook, discipline, and methods of their opposite numbers.

How, then, are we to justify the work that is being done by the existing Combined Operations organisation and ensure that it does not defeat its own object by appearing to make a black art of what every fighting man should know and practise almost as part of his basic training?

The Experimental Establishment and the Combined Signal School speak for themselves and cannot be accused of duplicating work which might be carried out as well elsewhere.

If we are honest with ourselves, and if we accept the fact that combined or amphibious operations as we all understand them to-day are really nothing more than seaborne operations, a very logical solution can be found. Two inter-Service schools already exist for the purpose of knitting together the teachings and doctrines of two Services only: the School of Land-Air Warfare and the School of Sea-Air Warfare, each staffed chiefly by officers of the two Services indicated by their titles, with one or two representatives of the third Service attached. It would seem simple and understandable to make the present School of Combined Operations the third member of this trinity and call it the School of Sea-Land Warfare. Since both the other two exist without the help of an independent headquarters in London, there seems to be no reason why the suggested new, or renamed, school should not do the same.

The Combined Operations Bombardment Battery is an obvious and proved requirement, and where better could it be housed and trained than in a School of Sea-Land Warfare?

There remains the London headquarters; its position in peace-time is anomalous, and its existence at the outbreak of hostilities will only tend to confuse the issue and there will be an excuse for the older ministries to disregard their inter-Service responsibilities and leave them to be handled by C.O.H.Q., so reverting to the emergency arrangements set up in the early days of the last war—which had outlived much of their practical usefulness even before the war in Europe had ended.

The training policy to be followed at Fremington can, as in the case of the two similar establishments already in being, be directed by the Training directorates of the appropriate Services, and administration can remain in the hands of the local command, where it rests at present.

The liaison functions which are the major part of the work of the headquarters to-day could much more easily and effectively be carried out by a small team of officers of the three Services working directly under the Chief Staff Officer to the Minister of Defence, who has virtually no "military" assistants. When first brought into being before the last war, the Defence Ministry was charged with the co-ordination of defence. There can be little objection to making it possible for co-ordination to start at the lowest possible level and so lubricate the complicated machinery of Whitehall.

The disbanding of the headquarters would remove an office where officers and other ranks of all three Services work together, alongside, and under each other. That this would be a pity goes without saying, but it must be admitted that, in peacetime, when uniforms are the exception rather than the rule in Whitehall, the argument loses much of its force; both officers and other ranks, whether they be male or female, look much the same out of uniform, and in any case either live at home or are accommodated with local units of their own Service; there can be no question of sharing mess life and being under a common disciplinary code.

We are left now with the representation of Combined Operational needs at the Chief of Staff and planning levels. Here, and nowhere else in the organisation, lies the danger of widening rather than closing the inter-Service gaps. No one can seriously believe that in these joint committees due weight is not given to the responsibilities of each Service to the needs of the others, and the idea that certain items only are of inter-Service interest and must be discussed in the presence of a fourth officer can quite possibly do more harm than good. A minor point seems worthy of consideration: just as the Chief Staff Officer to the Minister of Defence sits in with the Chiefs of Staff, so, if the Defence Ministry military staff is increased as is suggested, might the senior "military" assistant sit in with the Directors of Plans.

This concludes a necessarily brief outline of the present arrangements for the integration of the Services in the field of amphibious warfare and some suggestions for their improvement. In spite of the fact that we have always been faced with the necessity of fighting overseas, we are seldom ready to do so, and in an attempt to overcome this failing have saddled ourselves with a complicated and almost unworkable machine, which if it does not break down when the strain comes will once again lengthen the administrative tail. Let it be abolished. The arrival of the air threat, which overhangs both land and sea operations, has been effectively dealt with by orthodox methods which could with advantage in both manpower and money be applied to the old problem that has always been with us but has never been tackled until the last minute. Let us profit by the experience.

J. G.

CHAPTER XIV

THE STRATEGIC ROLE OF NAVAL SURFACE AND AIR FORCES

WORLD WAR II left the Navies of the world with an array of ships and other implements of war of the most diverse types and sizes: battleships and aircraft-carriers, cruisers and destroyers, submarines of several distinct classes, long-range and high-performance aircraft of all kinds, and missiles and devices of every description. Moreover, the war provided us with three-, four-, and five-year-long Naval campaigns of critical importance, extending across three oceans and the Mediterranean Sea. Every campaign presented phases of widely differing character and significance, and the lessons to be drawn from most of them have still to be fully placed before us. It is excusable, therefore, to enquire what definition can be given to the strategic functions of particular Naval units, but, with Naval reconstruction gathering momentum under the present threat to world peace, most cogent that they be now examined.

"Naval strategy," we are told by Mahon,* "has for its end to found, support, and increase, as well in peace as in war, the sea power of a country." Sea power, indeed, comes to a nation only if it possesses particular geographical position and features, and the ability, means, and inclination to exploit them for maritime development. It is essential to recognise, therefore, that the general nature of Naval strategy is the policy consequent upon more or less fixed national circumstances rather than upon the availability of particular weapons or ships. In fact, it does not essentially change with such developments.

Thus the roles of the various classes and types of Naval unit become dictated by the requirements of strategy, and no type, however new and powerful (though this appears often to have been forgotten), can by itself *determine* a fundamental principle of Naval strategy. The employment of the Bismark, for example, demanded no more of the British forces available in the North Atlantic than a continuation of the time-honoured British strategical policy, namely, to attempt to intercept and overwhelm the enemy's main Naval force before it could return to its base. The three traditional elements of our Naval strategy

- (i) to provide protection for a free flow of shipping between the United Kingdom and its sources of supply,
- (ii) to protect the British Islands and its oversea dependencies from invasion, and
- (iii) to provide support for British arms in military expeditions overseas, and cover their supply lines,

have not been altered by changes in types of warship or the introduction of submarines and aircraft. But the manner of execution of that strategy has, of course, varied greatly at various dates and in accordance with the

* "The Influence of Sea Power upon History."

fighting capacity and nature of the forces which may have been presented in challenge of our policy.

Traditional, also, is the small margin of Naval strength allowed in peace for meeting any such challenge! A measure of compromise is always therefore to be found in the provision made in peace for undertaking the roles required by the three principal operations of strategy named above, and rapid expansion of all forces after the outbreak of a war usually results in the continuation of many compromise ship designs for economic reasons.

THE ATLANTIC TREATY

Before one can proceed to examine the demands which may be made by national strategy it is necessary, of course, to be clear as to how far British obligations under our present international agreements may affect the position. This latter problem does not, in fact, appear to call for the consideration of conditions with which we did not become generally familiar during the course of the World War II. Vis-à-vis the Atlantic the pursuit of British strategical aims in the war against Germany, both before and after the latter's occupation of Denmark and Norway, and subsequently of the Low Countries and France, must closely resemble the aims which would be held by the Western powers in a war with the Eastern bloc, though in the first instance (that is to say, so long as no part of the Atlantic seaboard was occupied by the enemy) they might well be less closely threatened. The initial problem would, as before, be to dispose suitable forces for the protection of trans-Atlantic shipping against submarine and long-range air attack. As the struggle developed, however, as it might be assumed it would, along lines similar to those followed in the German strategy of the late war, the degree of threat would seem likely to again be increased. The strategical aims of the (probable) Allied powers would in fact be identical with the traditionally British ones. Though alliance would make a great difference in the size of the available forces, it would make no difference in the purposes of their employment, while the commitments would probably be heavier numerically.

The position of Great Britain would not appear, in fact, to be very much modified in respect of maritime strategy by the circumstances of the Treaty. The Naval forces of the United States are likely to have considerable commitments outside the Atlantic (North), while the national resources of France would, so far as this Treaty is concerned, almost certainly be heavily occupied with land warfare. In other sea areas, except possibly the Mediterranean, it is reasonable to suppose that the Naval powers would generally have to look after their own special spheres of interest, and, apart probably from varying degrees of mutual assistance, the basic features of British Naval strategy would remain unaltered.

THE INFLUENCE OF STRATEGY ON DESIGN AND EQUIPMENT

While it is axiomatic that ship and weapon design, on the one hand, and naval tactics, on the other, have the closest reactions upon each other, history has also shown that strategical policy has usually had a marked

influence in design, especially since science has widened the scope of the constructor. For example, in the earliest days of sail the largest and most heavily armed ships were of necessity clumsy to handle and slow, but later, as shipbuilding became a finer art, faster though less heavily armed ships were selected for strategical reconnaissance or commerce raiding; in recent years the appearance of the 'Deutschland' class of pocket-battleships and the non-development of aircraft carriers in the German Navy simultaneously with the construction of heavy armoured ships and aircraft carriers by England, the United States, and Japan, illustrate the result of widely differing strategical needs by Naval powers which expected to be in opposition in war, the last three named sharing many of the same aims.

Our future possible opponent in war would seem likely to have aims closely resembling those of Germany in 1939-1945, with the addition, and possibly advantage, of more widely dispersed initial outlets to the oceans. An important offset to this is that the country concerned may be much handicapped by lack of maritime tradition, unless strongly sustained by ex-German personnel; but this possibility should not basically alter the principles upon which England should calculate her Naval strategical requirements of ship and equipment design.

THE GENERAL REQUIREMENTS OF OUR NAVAL POLICY

The aims of our Naval strategy having been determined, it is then necessary to look very closely at the *tactical* possibilities of the present day, as well as the economic and logistic sides of the question, before the selection of suitable ships and equipment can be made.

The tactical possibilities must inevitably be governed by scientific development. The recent war taught many lessons in the tactical field; not the least of them is that military leaders are no longer as obtuse to the advantages offered by science as they were in the days when Mahon, deploring the usual delay shown in adapting tactics to suit newly produced equipment, wrote: "This doubtless arises from the fact that an improvement in weapons is due to the energy of one or two men, while changes in tactics have to overcome the inertia of a conservative class." It must, then, be assumed that our enemy will exploit both science and all former Naval experience of tactics if we are to equip ourselves suitably for the fulfilment of our selected strategic roles. No better example of the complete disregard of this principle can be given than in the British attempt to provide protection for convoys in the late war by means of the armed merchant cruisers of that date. Though some thirty-six such ships made an imposing contribution on paper to the list of forces available for the protection of shipping, none, except the two or three ultimately (about 1942) provided with catapults and seaplanes, was capable of any chance of success in action with the enemy; they were obviously unsuitable for engaging either submarines or warship raiders, though generally incapable, even had their captains wished it, of escape from them, and many were so lost; they were not armed for giving protection against air attack, and in the three engagements which the class had with German disguised merchantship raiders, one (the *Voltaire*) was sunk and two driven off seriously damaged.

In view of the possible development (mentioned earlier) in the course of a future naval war, the protection of trade must be provided to meet all forms of air, submarine, or surface ship attack, the latter two in areas widely separated from North Atlantic waters. For the other two of the elements of our Naval strategy named above (the protection of our territory against invasion, and the support of our arms in oversea expeditions) local conditions will, as always, govern the particular types of ship and weapon used. But experience has shown that the use of aircraft carriers and other major Naval units is usually called for, both because their presence may be demanded in a cover role and because their striking potential is so great.

STRATEGICAL ROLES AND VALUES OF VARIOUS NAVAL SURFACE AND AIR UNITS

In the practical application of sea power in war there are two main roles, that of finding the enemy and that of destroying him; they are both essential to it, and they are, of course, complementary. The history of World War II is full of examples where the ineffectiveness of the reconnaissance force, or the lack of mobility of the main fighting force, completely nullified a strong strategical position. Of the latter the situation at 10.30 on May 26, in the Bismark operation is a good example; the exact location of the German battleship was then known, and the C.-in-C. of the British Home Fleet had with him an entirely sufficient force for her destruction by gunfire and torpedoes, having also then superior speed, but he was still too far away to reach her before she could find shelter in Brest. This situation was redressed solely by torpedo-bombers of the Ark Royal, which was at the time approaching from Gibraltar. Examples of the former case are very numerous, but perhaps the most notable is that of the escape of the Scharnhorst, Gneisenau, and Prinz Eugen from Brest in February 1942. Here adequate forces for the interception and destruction of these ships were disposed at strategically advantageous points near the Straits of Dover, but the reconnaissance failed.

In the field of submarine warfare it was not until the satisfactory balance between both reconnaissance and striking forces had been made that the full *strategical* value of our anti-submarine strength was felt by the Germans. This was when, largely due to aircraft, U-boats could be located and attacked before they could use their speed in darkness on the surface and concentrate close around a convoy for attacks, against which the escorts would have been unable to act effectively. This forced a strategical change of plan upon the German Navy.

In raider warfare success again went to the side possessing adequate reconnaissance, even when totally unmatched to its opponents in fighting power as well as speed. Many of the German disguised raiders continued their operations for months in the South Atlantic and Indian Oceans because they were able to maintain strategical freedom from interference for a great part of the time, and in areas under frequent search by our own cruiser forces, by virtue of the reconnaissance flights made by the small seaplanes they carried.

History has demonstrated thus that in the application of naval strategy

the first consideration is always reconnaissance and the second mobility; the value of the forces used depends upon their capabilities in these two respects. The strategical role assigned to every class of vessel or aircraft available for Naval use does indeed depend greatly upon its special value in one or other of these directions, and this has never altered. Whether long-range Catalina flying-boat, distant patrol submarine, or eighteenth-century frigate, the need has always been there for the "eyes of the fleet"; and it was the quality of relatively high mobility which enabled Force "H" (with its air component) from Gibraltar to strike vitally the escaping Bismark, and lack of it which prevented the Home Fleet (without an aircraft carrier) from averting the breakout of the Scharnhorst and Gneisenau into the Atlantic in January 1941. Throughout the American and Japanese naval and military operations in the central and western Pacific, the superiority of the aircraft carrier over other means of providing reconnaissance, and its capacity for endowing both naval and military striking forces with a high degree of mobility, raised its importance among naval units to the first place. There were few fields open to the application of naval, military, or air pressure in which the swift blows of carrier-borne aircraft in the hands of American and Japanese commanders alike were not at one time or another driven home with staggering suddenness and force—to mention but a few, Pearl Harbour, the sinking of the *Hermes*, *Dorsetshire*, and *Cornwall*, the Tokio raid by carrier-borne Mitchells, the sea victories of Coral Sea and Midway, and the descent upon Japanese supply lines in the China Sea.

In support also of both offensive and defensive military operations, as in Norway and the Western Desert, and particularly in support of long-range assaults, as at Salerno, the South of France invasion and the recapture of the Philippines, the carrier has played a vital role by the provision of air cover, artillery observation, and ground attack as well as by non-combatant services (of strategical importance, however) such as the transportation of fighter aircraft directly into an operational zone. On many of those occasions the carrier's presence has been the determining factor in the practicability, or otherwise, of the expedition.

In such ways as the above recent history has revealed, the great *tactical versatility* of shipborne aircraft and, hence the preponderating strategical importance of the type of vessel which is their highly mobile base. It is therefore of particular interest to examine practical designs now indicated by experience with this class of ship, and also to consider what proportions of this and other classes are appropriate for our fleets to-day. In order to bring these into relative focus, however, the present known functions of all types are first set out here.

SUMMARY OF POLICY, ROLES, AND UNITS USED

In the table below are shown the principal strategical purposes to which the British Navy may be expected to apply its sea power, and against each the particular roles required to be fulfilled and the type of unit appropriate for each.

From this table it can be seen that shipborne aircraft can play important parts in most types of modern naval operation, and in many of those forming a part of British military strategy. For reasons which are well

Strategical Policy	Strategical role	Appropriate unit for:	
		Reconnaissance	Combat
Protection of shipping	Anti-submarine	Long-range and local A/S air patrols *	Strike * A/C, surface A/S vessels.
	Air cover	Air warning radar (shipborne and land)	Fighter * escort.
Territorial and Local waters defence	Surface (ocean) escort and cover	Long-range and local air recce. patrols.*	A/A ships, guns.
	Main battle cover	do.	Surface warships, air strike.*
Oversea offensive operations	Local cover and patrol	Local air warning, ship and air patrols, submarine patrols	Naval task force.*
	Transit cover	(As for protection of shipping)	Air strikes, submarines, M.T.Bs., Artillery.
	Assault cover	Air* and radar	—
	Long-range air strike	Air*	Fighters,* naval task force guns.
	Bombardment	Air* and ship	Carrier-borne.
			Naval task force.

* Including shipborne aircraft.

known the provision of such aircraft by flight from the decks of carriers provides the following advantages :

- (i) They can be operated in almost all weather conditions and at night.
- (ii) Within certain size limits, aircraft of very high performance can be used; owing to carrier mobility, performance can be provided at the expense of range and can then be much superior to aircraft from necessarily distant shore bases.
- (iii) Large concentrations can be made at distant objectives.
- (iv) They can be refuelled and rearmed at very short intervals for renewed attacks, when at such distant points.
- (v) Their base (the carrier) is less vulnerable than many land bases, owing to its mobility.

In some circumstances, especially where economy of effort and space is necessary, other types of shipborne aircraft, catapulted landplanes and seaplanes and helicopters can offer some of the above advantages over shore-based planes.

GENERAL DESIGN REQUIREMENTS FOR AIRCRAFT CARRIERS

The roles in which aircraft are employed (stated above) fall into three general classes from the carrier design point of view. There are first those where the largest numbers of aircraft have to be used at the same time, and where, often as the direct result, the heaviest scale of counter-attack may be met with; for such roles the *Fleet* type of carrier has been designed. An intermediate class, the *Light Fleet* and *Escort carriers*, has been developed for such purposes as Convoy escort and long-range assault landings where the use of lighter, slower, and more vulnerable ships can be accepted and fewer aircraft needed for simultaneous operation by any one unit. The third class includes all those in ships which can operate from one to four or so aircraft in favourable conditions only, where the

duties called for are at numerous, but widely dispersed, points, and where economy of effort demands the use of other kinds of ship, needed in any case at such places, rather than a specialised aircraft carrier. To this class belonged, during the late war, catapult-carrying battleships and cruisers, catapult aircraft (fighter), merchant (C.A.M.) ships, merchant aircraft carriers (M.A.C. ships) and seaplane carriers.

FLEET CARRIERS

That this class of ship has the right to be called "the Core of the fleet" is possibly still disputable; but facts speak for themselves, and it is significant to note the following figures:

<i>The British Fleet</i>	<i>Capital Ships</i>	<i>Seagoing Carriers (in commission)</i>
1918	45	1*
1929	15	4
1941 (early)	14	7
1945	12	40 (approx.)

* Campania.

The present figures are difficult to state fairly, but it is estimated that, including ships in Reserve, the ratio of capital ships to carriers is 1:4. There has been a great divergence of opinion between British and American Naval officers on the structural features which fleet carriers should have, the former preferring robustness and armour, the latter the maximum possible carrying capacity; the British (Illustrious) type all stood up well to the severe test, in Pacific operations, of being struck by "suicide" bombers, which exploded relatively harmlessly on their flight-deck armour, while the American ships, similarly hit, became severely damaged. On the other hand, the offensive power of the U.S. carriers was greater.

There has been no disagreement about speed; a fleet carrier must be able to keep its position with the fastest Task Force, even though operating routine patrol and other flights; this means a margin of speed well above the fastest warship. Strategical mobility also demands high speed and endurance; several of the most important Allied successes at sea in the war were only secured by virtue of those attributes in their carriers. Thirty-four knots might be regarded as the smallest acceptable speed for a modern fleet carrier, for these reasons alone.

Such speeds demand relatively long hulls, which are, of course, also favoured for aircraft operating reasons. But even with ships of given length, other considerations about which controversy still exists (and which mainly affect strength and fire safety), such as hangar armour, external lifts, and internal subdivisions, are of primary importance in determining the numbers of aircraft which can be carried below the flight-deck. They largely account for the smaller numbers in British carriers.

A further important question is at issue, the possible use of carriers for relatively heavy strategical bombing aircraft; the structural problems would not seem insuperable, but two serious planning difficulties would have to be faced. The first is navigational: the ships would have to be very large; would it be possible to use them from our existing harbours and bases? The second, economic; would such very expensive ships not have to lie idle except when national strategy should demand this particular kind of strike?

One hypothetical question also remains still unanswered. Can a practical economy in keels, personnel, escorts, and other important ways be made by combining the carrier with the "combat" unit? One of the first United States carrier designs * mounted 8-inch gun turrets. More recently, when the Graf Spee and Admiral Scheer were at large in the Atlantic, the pairing of carriers with capital ships into Hunting Groups was demanded by Allied strategy. With modern weapons a successful unified design would give a versatile Naval fighting unit—perhaps a new form of capital ship?

INTERMEDIATE CARRIERS

Of this class the first to be produced, the escort carrier, has seen most Naval active service, while that type's variants, the 'Assault' and 'Ferry' carriers came also to be regarded as a very necessary part of a fleet's equipment. But these ships, relatively slow (18 knots) and very lightly constructed for fighting service, were much improved upon in the British light fleet with 6 knots more speed and warships' scantlings. The United States continued the intermediate class on cruiser-type hulls, giving their ships a much higher speed and, like their fleet carriers, greater carrying capacity than ours. The keynote of the design is that they should be more economical to produce and operate, particularly from the manning point of view, than the "Fleets," though but a small number of those built by us are in commission in our Fleet.

British carriers now in Korea, of the light fleet class, are fulfilling many army co-operation and other fighter support duties, for which type of work they are well enough suited, except in regard to numbers of aircraft carried per ton! Are they (the "Light Fleets") really large and fast enough for operating the general reconnaissance and fighter aircraft now being developed, or really economically enough produced and manned for large-scale employment in war on the shipping routes in the North Atlantic?

Undoubtedly the last word has by no means yet been said as to the minimum practical size for anti-submarine aircraft; the tendency now seems, regrettably, for them to grow larger and more complicated all the time, though production and manning problems, and statistics on the minimum acceptable flow of shipping, should most imperatively demand smaller and more economical ones. For although modern submarines may now be most difficult to locate and attack, the total absence of any kind of aircraft from the neighbourhood of valuable ships at sea in many parts of the ocean would certainly mean "easy meat" for both surface and submarine raiders. For the protection of convoys on the more important and valuable routes against such attacks the simplest A/S aircraft and the smallest practical ocean-going carrier must be devised; for areas which could not be avoided and in which local fighter cover was found necessary, additional protection, possibly by intermediate class fighter carriers, would of course be needed.

In the design and operation of fighter carriers much help is hoped for by the development of the "flexible deck" principle, about which some information has already been made public. The device can lead to

* Lexington and Saratoga.

advantages in carrier economy as well as in aircraft performance, for it should enable smaller, and possibly slower (when in conjunction with assisted take-off), ships to be used for this particular role. It suggests that within the intermediate class specialised fighter carriers may again be included.

MISCELLANEOUS TYPES OF CARRIER

Coming within this category are the many other practical classes of aircraft-carrying ship which have been already referred to. Some of them were, during the late war, of a very extempore kind whose disadvantages are now well enough known. But the vital and vulnerable sea routes are numerous and usually very long; even 'Woolworth' types of carrier proper could not possibly be used for more than a fraction of our convoys. Therefore there is an inevitable need to plan for the provision of many dual-purpose ships—the aircraft/cruiser or the cargo/aircraft types. Of those already used, the oil- or grain-carrying M.A.C. ships were probably the best for North Atlantic weather, though in other areas floatplanes often (especially in the German raiders) proved capable of surprisingly good service. Helicopters may now show themselves to be easier to operate and as reliable. Albeit, the warship of to-day which has to operate alone without any kind of aircraft must find itself at a severe disadvantage.

CONCLUSION ON THE PROPORTIONS OF CARRIERS NOW NEEDED

The lessons of history do not show that armoured fighting ships will not be used should war again break out between maritime powers in the near future; heavy guns may be replaced sooner or later by other missile projectors, but Naval units seem unlikely to rely entirely on aircraft and ship-launched torpedoes for striking the enemy. Similarly, technical and economic considerations still make it improbable that long-range land-based aircraft will be available, or even preferred to those brought nearer to their task by ships, in many of the sea areas where sea power enables ships to operate. Consequently, unless carriers and "combat" types of ship become combined, both classes of unit must be available in every major Task Unit and force.

War experience, which the progress of post-war years has provided no ground for modifying, has shown that in a modern naval force no matter what its objective the numerous functions allotted to aircraft demand the presence of a minimum of two large carriers per force; this in future may well mean two per capital ship of the total naval strength of the nation. For special tasks, one per cruiser squadron would not appear excessive. Of the smaller types of carrier the numbers must necessarily be related to the military commitments and the shipping areas uncovered, or incompletely covered, by shore-based air units.

Perhaps the most vital question to be assessed and accorded public recognition is the unhappily large number of years that it takes to provide the material, and to equip and train the personnel, needed to enlarge the carrier component of any fleet.

"VOLAGE".

CHAPTER XV

THE ENTRY AND TRAINING OF NAVAL OFFICERS

THE KING'S LETTER BOYS

IN THE reign of King Charles I, when the idea of a permanent Naval Service was still in its infancy, Nathaniel Boteler suggested in his "Dialogues" that there should be some post on board ship which might "lead, in a fit way, toward the making of a Lieutenant." Boteler was a generation ahead of his time, but under Charles II, when the Royal Navy was becoming accepted as a national institution, Mr. Secretary Pepys sent out letters establishing the class of "Volunteers-per-Order" for boys sponsored by the Crown who aspired to become sea officers. Captains of ships still entered other Volunteers without reference to the Admiralty, but the King's Letter Boys, as the Volunteers-per-Order were called, were the official forerunners of the naval cadets of to-day. Despite the early start made and the intermittent interest of successive Admiralty boards, often promoted from without, it was only in 1837 that their Lordships organised training for all young officers; and they did not assume effective control of entry until 1851.

For nearly two centuries the vast majority of young gentlemen entered the Service by private arrangement between their parents and the captain of a ship or, in the later years, through the interest which could be wielded on their behalf with the Admiralty. The training they received depended entirely upon the captains under whom they served. Some left their youngsters to pick up what knowledge they could; others took a real interest in their *protégés* and ensured that they were given a good professional grounding. There was no system; entry was controlled by patronage and training depended upon chance. The life was a hard one, and no amount of interest could mitigate its rigours, which helped to ensure that those who became lieutenants and captains were fairly competent; the rest dropped out either because they lacked stamina or because, lacking influence, they were not sufficiently outstanding to attract attention.

Although it was not until the middle of the nineteenth century that the Admiralty made arrangements for the training of *all* young officers, they did persist with the scheme for entering and training a few, which began with the King's Letter Boys. And in 1677 they issued, by the hand of Mr. Pepys, the first orders "for the qualification of persons to enable them to become Lieutenants" which, though the rules were often circumvented, did give the Admiralty power to control promotion into the qualified professional class from which alone the Lieutenants of the Fleet could be selected.

THE NAVAL ACADEMY

In 1733 the King's Letter system was replaced by the Naval Academy in Portsmouth Dockyard. Here up to forty students, "the sons of noble-

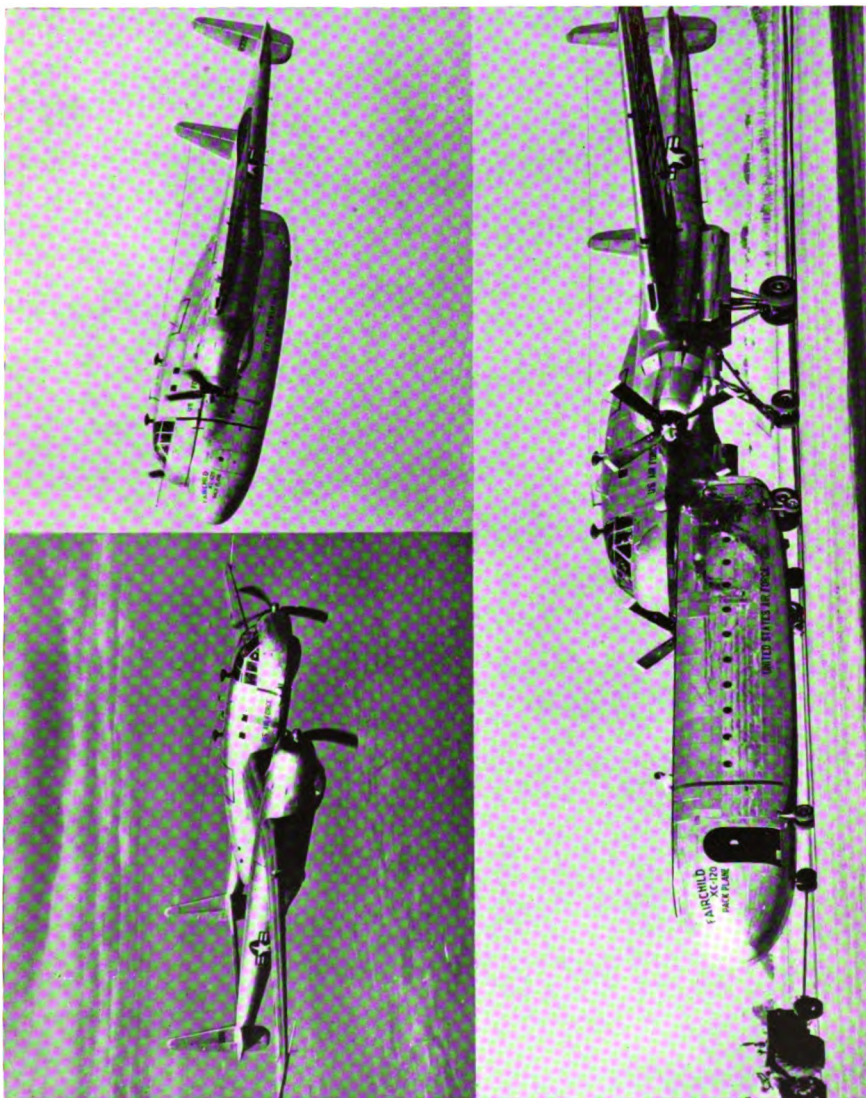
men and gentlemen," spent between two and three years in completing the "Plan of Learning," and copying it out fair in a handsome book, before going to sea as midshipmen. King's Letter Boys had been under 16 on entry; students at the Academy, who paid twenty-five pounds a year for their keep, had to join between the ages of 13 and 16. But a good patron was a greater help to a young officer than an academy certificate; so there were never a great many students, and in 1773, when there were only fifteen in residence, the Admiralty offered fifteen places free to the sons of officers. In the same year, perhaps in commemoration of an inspiration by George III, it became the Royal Naval Academy.

The changes of 1773 did not, however, enhance the establishment's reputation, and at the beginning of the new century Lord St. Vincent, who was First Lord from 1801 to 1804, evidently thought a parent would be wiser to send his son straight to sea with a good captain. Nevertheless, the Admiralty continued to foster their scheme, and in 1806 the Academy was overhauled, enlarged, and reconstituted as the Royal Naval College. Thereafter it seems to have prospered for a while, but when the Napoleonic wars ended students became fewer and the College declined as the Academy had done before it. In 1829 commissioned officers on half pay were allowed to attend the College, apparently to take the same course as the boys. It is not clear whether this was a serious attempt to improve the standard of book-learning in the Fleet or merely an expedient to keep the College usefully employed. It must have been a reasonably successful innovation, for under this regime the College ran for another eight years, and although in 1837 it was closed to the young entry it was re-opened in 1839 for master's mates, who were re-named sub-lieutenants in 1861.*

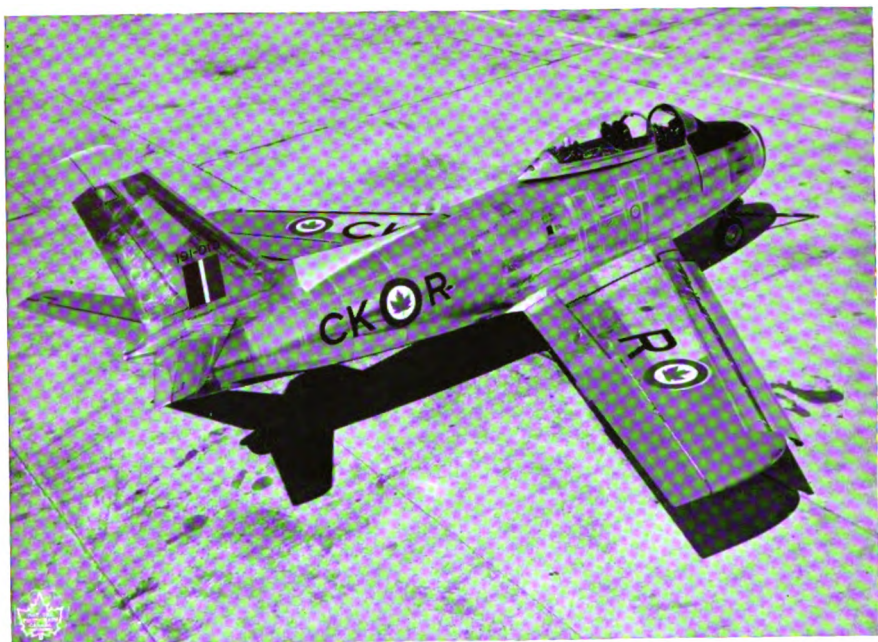
SEA TRAINING FOR ALL

In 1837 their Lordships abolished entry through the College, sent all Volunteers straight to sea, and arranged that in every ship they should be taught by a Naval instructor and schoolmaster who was a university graduate. Admiral Richmond, in his book *Naval Training*, says that this somewhat surprising change was made because the two different systems caused inconvenience and because there was jealousy between the Collegians and other entrants who, though less favoured by authority, proved themselves better officers. Professor Lewis, on the other hand, suggests that the change was a tactical move by their Lordships. "Thwarted in their attempt to train the few for high command *before* they sent them to sea," he writes in "England's Sea Officers," "they now bowed to privilege and prejudice, and sought to train all after they had got them on board." Whatever the reasons which induced the Admiralty to start it, the scheme was not a success, "on account," as Admiral Richmond puts it, "of the unsatisfactory conditions it entailed of combining scholastic with professional training." After twenty years this system was replaced by the "Britannia," and since then all Naval cadets, as they became in 1843, have been given some basic training before being sent to sea.

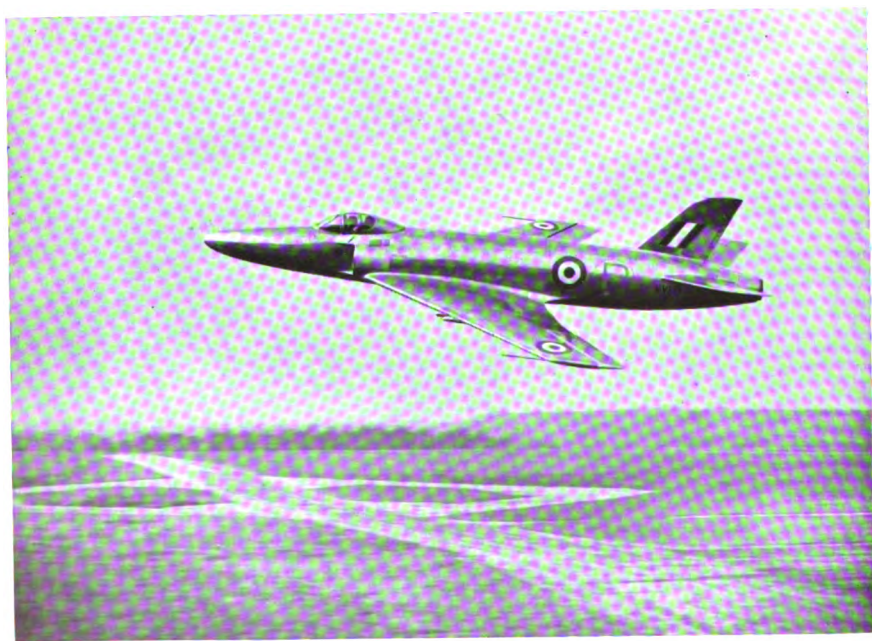
* Posts for sub-lieutenants were established in 1801 by Lord St. Vincent as a relief for midshipmen who had served their time and passed for lieutenant but for whom no lieutenants' posts were available. These original sub-lieutenants had almost died out by 1830.



Fairchild XC-120 Pack Plane



Canadian Sabre (F.86)



Supermarine Type 535 Jet Fighter

ADMIRALTY CONTROL OF ENTRY

In 1837 the Admiralty had assumed responsibility for training of all young officers, and the establishment of H.M.S. Britannia was the next step towards making the training efficient. The methods of training were changed abruptly in both 1837 and 1857; but the rules governing entry needed more careful handling, and the Britannia had been training cadets for some years before the very long standing custom by which the flag officers and captains chose nearly all officer entrants from among the sons of their friends and acquaintances was finally brought to an end. After the Napoleonic wars the Admiralty reduced the number of Volunteers who might be entered by captains, and in 1833 ordained that they must be "approved by Admiralty." In 1838 it was ruled that Volunteers must "be able to write English correctly from dictation, and be acquainted with the first four rules of arithmetic and the rule of three," and a year later Volunteers were made to pass a rather more exacting examination before being rated midshipmen. From about this time, too, candidates were examined by a surgeon, though apparently not very searchingly. By 1848 captains no longer entered Naval cadets themselves. Flag officers and captains merely nominated candidates who, if they passed the examination and satisfied the surgeon, were appointed to ships by the Admiralty. The rules of 1848 allowed Commanders-in-Chief two nominations on appointment and captains one on commissioning a ship, and the nominees had to be between the ages of 12 and 14. In 1851, by making the entrance examination a reality and stating that a candidate's failure cancelled his nomination, the Admiralty established control of entry.

In 1871 limited competition was introduced, nominations being accepted for twice as many candidates as there were vacancies, which were allotted on the results of a competitive examination. Thereafter, despite the protests of those who hated to lose their privileges and of those who honestly felt that only naval officers were qualified to choose their successors, the principle of competition steadily replaced that of nomination. As a last vestige of the old practice, Dominion and Colonial Governors are still, in 1951, "allowed to nominate exceptionally, for appointment to Cadetships outside the normal entry arrangements, specially recommended candidates" from their territories who fulfil certain conditions and can reach the necessary standard.

In the early days of the Britannia cadets joined at about the age of 13 and were given a two-year course, consisting mainly of professional training but including some normal education. During the forty-six years which the system lasted various changes were made, and by the end of 1902, when the Selborne scheme was published, the age of entry had become $14\frac{1}{2}$ to $15\frac{1}{2}$ and the course had been reduced to four terms. The Britannia did ensure that midshipmen joined the Fleet with a good grounding in the elements of their profession; but it did not give them a balanced secondary education, such as they would have received at public schools or, for that matter, at grammar schools, and it did not release them from the schoolroom.

Departmental committees in 1870, 1875, and 1885 all recognised the defects of the system. Admiral Shadwell's committee in 1870 reported that there was a "general incompatibility on which many of the most

experienced witnesses strongly insist, between the position of an officer and a schoolboy, which it is attempted to combine in our present system." They recommended three years in a harbour training ship followed by a year in a seagoing training ship before joining the Fleet. Admiral Rice's committee of 1875 supported the Shadwell recommendations, and suggested that the Britannia should be replaced by a shore college "on the lines of the best public schools," that midshipmen should be relieved from "mere school studies," and that the age on going to sea should be about 16. The Luard committee of 1885 condemned the whole existing system. It deplored that the "general education of an English gentleman should be cut short at thirteen," pronounced the Britannia ineffective, and strongly disapproved of attempting schoolwork at sea. This committee recommended that the Britannia course should last for a year, from the age of 16 to that of 17, and that in it professional training should be interspersed with secondary education. The Headmasters' Conference approved generally of the Luard committee's proposals, perhaps out of a desire to co-operate with an Admiralty newly awakened to the advantages of secondary education, but in the end the proposals were found impracticable, as they would have required boys to leave school in mid-career.

During the Britannia's training life none of the major proposals made by the various committees were acted upon. All the committees condemned the system of which Britannia formed part, even when they did not decry the ship herself; but it was the system which produced all the officers who led our fleets in World War I, and many of their successors in the World War II. When it was superseded it was not as the consequence of any committee's report but because a dynamic Second Sea Lord had ideas and was able to carry his professional and political colleagues with him.

THE SELBORNE SCHEME

The Selborne Scheme, which was published in December 1902, was largely the work of Admiral Sir John Fisher, then Second Sea Lord, but it had the unanimous approval of the Board, of which Lord Selborne was First Lord. From the assumption that "as machinery is as much an integral portion of a battleship's power as were the masts and yards of Nelson," Fisher reasoned that much closer affinity between executive and engineer officers was essential. To achieve this all cadets for the executive and engineering branches, and for the Marines, were to be entered together at between the ages of 12 and 13. After being trained alike until they reached the rank of sub-lieutenant, at about the age of 20, they were to be distributed between the branches. Those who became engineers would retain their military and executive status, and all officers would have equal chances of promotion. The larger number of shore appointments for both Marine and engineer officers, and the extra pay enjoyed by the latter, were expected to attract the necessary volunteers; it was even suggested that too few of the more talented officers would wish to remain executive.

At the Royal Naval College, where the cadets would spend their first four years, at a charge to their parents of seventy-five pounds a year, the course would be on the same lines as that given in the Britannia, but with the addition of "thorough elementary instruction in physics and marine engineering." The more complete College course would make naval

instructors unnecessary in the Fleet. Midshipmen would no longer spend much of their time in school learning mathematics and theoretical navigation from the naval instructor; instead they would be "instructed in mechanics, other applied sciences; and marine engineering under the supervision of the engineer officer and of the gunnery, navigation, Marine, and torpedo lieutenants." Each year they would be examined to ensure that they had reached the necessary standard, and after three years they would pass in seamanship and be promoted acting sub-lieutenants. They would then go ashore for courses, three months at Greenwich and six months at the specialist schools in Portsmouth, after which they would return to sea as confirmed sub-lieutenants to get their watch-keeping certificates.

The scheme as it developed differed somewhat from the original intentions. The Royal Naval College at Dartmouth, designed to hold the Britannia cadets more suitably, was already being built. It could not at that stage be enlarged to hold the extra numbers which the four years' course and the absorption of the engineer and marine entries would need. So a junior college, to take the cadets for their first two years, was hurriedly set up in the stables of Osborne House in the Isle of Wight.

Meanwhile the old system could not stop until the first products of the new became available. So the Britannia system, housed ashore at Dartmouth from September 1905, went on until the last term passed out to join the training cruiser H.M.S. Isis at the end of 1906. The first term of Selborne scheme cadets joined Osborne in September 1903, and after two years there went on to Dartmouth when it opened; so for four terms the new college held cadets of both the old and new schemes.

The course given at the colleges to the early "Selborne" cadets was very much as in the memorandum, with the addition of English and history, which it had always been hoped could be included. On the recommendation of the Douglas committee, which considered the matter in 1905, cadets then went to a training cruiser for eight months before going to the fleet as midshipmen. Naval Instructors were retained, but the courses for sub-lieutenants at Greenwich and in Portsmouth were dropped. Instead, after three years at sea midshipmen had to pass for lieutenant in seamanship, navigation, engineering, gunnery, torpedo, and voluntary subjects. They were then promoted acting sub-lieutenants and remained at sea to obtain their executive and engine-room watchkeeping certificates.

THE CUSTANCE COMMITTEE

The first "Selborne" midshipmen took their examinations in May 1911; and the results so disturbed their Lordships that the marks were reclassified and the syllabus reduced for all future occasions. The results of the next two examinations were still unsatisfactory, and there were a distressing number of failures; so in March 1912 the Admiralty appointed a committee under Admiral Sir Reginald Custance "to enquire into the education of Cadets, Midshipmen, and Junior Officers of His Majesty's Fleet and cognate subjects."

The Custance Committee strongly criticised the misemployment of midshipmen, some of whom they found were "kept constantly under instruction and subjected to a weekly paper examination." They reported

that the severe pressure of the examination for lieutenant was diverting midshipmen from practical to school work, and that the voluntary subjects, which had to be taken to obtain good promotion marks, by increasing this tendency were positively injurious.

As a consequence of the committee's reports, though not entirely in accordance with its recommendations, many changes were made in the training system. The age of entry to Osborne was raised by a year, to conform to the normal age of leaving preparatory schools and thus attract more and better candidates; the number of King's Cadetships, free or at reduced fees, were increased to widen the source of supply; the Dartmouth and Training Cruiser courses were adjusted to allow more practical work in the cruiser; midshipmen's time was reduced by eight months; the examinations for the rank of lieutenant were re-organised; and courses for acting sub-lieutenants were restored. It was also intended to halve the training cruiser time and, once more, to withdraw Naval Instructors from ships; but the war intervened before these steps were taken. The Custance Committee marked an important stage in the development of the Selborne scheme; the reforms which followed gave the scheme its final form, and incidentally undid the work of the Douglas committee.

THE SPECIAL ENTRY

Early in July 1913 it became evident that even if larger numbers were entered at Osborne there would soon be a temporary shortage of junior officers in the Fleet. A committee, led by Rear-Admiral Hugh Evan-Thomas, considered what arrangements should be made for training cadets whom it was proposed to enter from the public schools and elsewhere as a temporary measure. They reported that the cadets should be accommodated in a cruiser based on Devonport and given an eighteen months' course. Two-thirds of the time should be spent in Devonport, where the cadets could be taught in the existing schools, and the rest should be spent cruising. On joining the Fleet these officers would be treated exactly the same as those from Osborne and Dartmouth, but would serve six months less as midshipmen; they would be about a year older on promotion to lieutenant.

The report was accepted and in the summer of 1913 the first candidates presented themselves. After being interviewed and medically examined they took the same written examination as the candidates for Woolwich and Sandhurst and, on September 15, the forty-two who passed joined H.M.S. Highflyer. After six months at Devonport the ship cruised with the cadets to the Mediterranean for three months, and then, after another month at Devonport, attended the test mobilisation at Spithead. On the outbreak of war Highflyer went to her war station and the cadets were appointed to gunrooms in the Fleet; by Christmas all had been rated midshipmen, without examination, by their captains.

WORLD WAR I

The war made the need for junior officers even more urgent, so their Lordships decided to continue with the Special Entries. Training in a cruiser was out of the question, but Keyham, which had opened earlier in the year for the training of engineer officers under the Selborne scheme,

was empty and would do very well. Quick results were needed, and the Admiralty ordered that the cadets were to be given three months' strictly practical training "in order that, before being drafted to ships, they may become sufficiently acquainted with the Naval Service to be of some value as Junior Officers." They were to be eligible for drafting to sea as soon as the captain considered them efficient, even if they had not completed three months' training. Thus the Special Entry system started its second phase, and during the war eight entries, each of between sixty and eighty cadets, were trained and sent to sea. They proved a success, and when the war was over the Special Entry system was continued, with cadets receiving a year's training.

The war gave the Special Entry a chance to prove its value, for originally the Admiralty had only intended to use it to fill a temporary shortage; but the rest of the officer training system was seriously disrupted. On mobilisation the two terms of ex-Dartmouth cadets in the training cruisers and all the cadets at Dartmouth, who had scarcely any real acquaintance with the Navy, went straight to sea, and sub-lieutenants' courses were stopped again.

For the duration of the war immediate needs had to be met and there was time for only the essential minimum of training; but with the return of peace in 1919 the old routines were resumed with comparatively few modifications. One of these was significant; it made the examination in engineering for the rank of lieutenant voluntary for Dartmouth-trained midshipmen, who were thus brought into line with their Special Entry colleagues who had not been taught any engineering at Keyham.

CAMBRIDGE

Before the old routines could be in full operation something had to be done about the hundreds of younger officers whose formal education and training had been so drastically cut short by the war. As junior officers they had done well, but in the struggle for the higher ranks both their seniors and juniors might have an advantage. The Admiralty handled the problem with imagination and understanding; they sent the officers concerned to Cambridge for a year. So from January 1919 until December 1923 there were Naval officers at Cambridge trying to fill in the gaps in their ordinary education. Before the last of them came down, their successors, who had missed the war at sea, were emerging from Greenwich which had been re-opened in January 1923.

RETRENCHMENT

Meanwhile post-war retrenchment was affecting the earlier stages of training. The Special Entry of October 1918 contained eighty-one cadets, and the new term at Osborne in January 1919 was over a hundred strong. Then the Geddes axe fell and nearly half the cadets at the colleges had to be withdrawn. Those parents who took their sons away voluntarily received 300 pounds; those who waited to be told to go got nothing.

By May 1921 there were eleven "terms" at Dartmouth, the course had been reduced by one term so that all cadets could be fitted into the one college, and Osborne had been closed. From Dartmouth cadets went to the training ship *Thunderer* for eight months and there joined their Special

Entry opposite numbers who, at that time, were trained for a year in the ship. This regime continued until Easter 1924, when the seagoing training ship for cadets was paid off. For eight years thereafter Dartmouth cadets went straight to the Fleet, where they served eight months as cadets before being rated midshipmen. Special Entry cadets were given a year's training in H.M.S. Erebus at Devonport and then went to sea as midshipmen.

THE PURPLE STRIPE

In 1921 the Selborne scheme idea of complete interchangeability between deck and engine-room was dropped and, with the exception of a few who gave up engineering and returned to upper deck duty, ex-cadet officers who had specialised in engineering ceased to be eligible for executive posts. In the same year the arrangements for engineering training were altered so that those joining the branch started their specialist training as midshipmen. Common training for the executive and engineering branches therefore ceased at the end of cadet's time. In 1925 the specialist (E) officers shipped the engineer's purple distinction cloth between their stripes.

THE NINETEEN THIRTIES

In 1932 the training cruiser was re-introduced. Dartmouth cadets spent two cruises, the equivalent of terms, on board, and until 1938 Special Entry cadets did their whole year of training in the ship. Increased numbers then made this impossible, so later entries spent their first term in a harbour training ship. In 1935, with the possibility of a war with Italy confronting us and the beginnings of the re-armament programme about to bear fruit, there were signs that we should once again be short of junior officers. During the next three years a few were entered from the Royal Naval Reserve, but their Lordships were determined not to risk another axe. For war expansion, if it should become necessary, they intended to rely on the Reserves and on "Hostilities Only" officers; while peace survived the Regulars would have to achieve more. So to reduce the time taken for training the sub-lieutenant's course at Greenwich was dropped and the elementary war course, which had been done with it, was transferred to Portsmouth.

In 1937 a major administrative change was made at Dartmouth when the "term" system, which had been in use from the beginning, was replaced by "houses" on the lines of those in ordinary schools. In the "term" system each entry of cadets formed a "term," named after a distinguished admiral, which lived, worked, and played as a unit. It was unusual for cadets to know anyone outside their own term; indeed, contacts between terms were discouraged, and the system instilled a strong sense of seniority. In the "house" system cadets study by terms, but all other activities are by houses. Cadets do not, perhaps, acquire so acute a perception of their place in the Naval seniority list; but in the houses there is more need and opportunity for them to lead and influence their juniors.

SHORT SERVICE COMMISSION IN THE AIR BRANCH

When the Admiralty began to take over full responsibility for Naval aviation in 1938 they had to provide naval pilots and observers to replace

the Air Force officers who had hitherto flown most of the Fleet Air Arm aircraft. They solved the problem by arranging for a few flight lieutenants and squadron leaders with carrier experience to transfer to the Navy as lieutenant-commanders (A), and by entering midshipmen (A) for short service in Naval aviation. On entry, and before starting their flying training, these midshipmen (A) were given a short course on the same lines as the first war Special Entry, but were more fortunate in being accommodated in the small aircraft carrier *Hermes* instead of on shore. After this preliminary course they went to Royal Air Force establishments for flying training.

PREPARATIONS FOR WAR

In the spring of 1939 the *Frobisher*, in which the Special Entry cadets were then doing their first term, started to fit out for operational service. For the summer term the new Special Entry cadets went to Dartmouth, where they were housed in the seaman's barracks, which had hardly been used since the ship's company had been reduced in 1931. The *Vindictive*, the seagoing training cruiser, continued for another term, and then on the outbreak of war she too joined the Fleet.

WORLD WAR II

This time the declaration of war caused no sudden dislocation of the training routine for Regular officers. As far as possible everything went on as before, but unessentials were left out and courses shortened. Midshipman's time was reduced to sixteen months and as much as possible of the training cruiser course was given in an extra term at Dartmouth. These were the only changes which the war made necessary; even the numbers entered were increased barely enough to cover the extra wastage of war casualties. That later on Dartmouth was bombed and the college had to carry on its activities elsewhere was inconvenient but incidental: it had little effect upon the training.

PEACE

With the return of peace in 1945 the pre-war arrangements were restored. Cadets joined Dartmouth at the age of 13½ for eleven terms, or at about 18 for only one; they went to the training cruiser for eight months and then on to the Fleet as midshipmen. Then the branches diverged, executive and supply midshipmen served for sixteen and twenty months respectively before becoming acting sub-lieutenants and going ashore for courses; midshipmen (E) spent only eight months at sea before going to the new Engineering College at Manadon, which replaced Keyham. Even so the principle of common training had won a small victory, for this eight months sea time for midshipmen (E) was something quite new. For the newly formed Electrical Branch, for which the first cadet entrants joined in September 1947, common training must still end with cadet's time, because midshipmen (L) go from the cruiser to Cambridge, or other universities, and do not appear again at sea until they have taken their degrees.

THE SIXTEEN-YEAR-OLD ENTRY

On May 6, 1947, the government announced the most fundamental change in the arrangements for entry and early training since the publication of the Selborne memorandum. For forty-five years the principal way to become a naval officer had been to enter Dartmouth on leaving preparatory school or, since 1940, by getting a scholarship from a secondary school at the same age. The Special Entry, originally a temporary expedient, had been used since 1919 to adjust the supply of junior officers. Because nearly all Dartmouth cadets became executive officers there had been few executive vacancies for Special Entry, which had, therefore, provided nearly all the engineer and supply officers. These two entries* provided the vast majority of officers for the executive, engineering, and supply branches; the schemes for promotion from the lower deck, begun when Mr. Churchill was First Lord in 1912, were still producing very small numbers.

By the new arrangements, the details of which were given to the House on January 28, 1948, up to 25 per cent. of the officers of the Navy are to be obtained by promotion from the lower deck; the rest come from Dartmouth and the Special Entry, each of which provides equally for the executive, engineering, and supply branches, to which cadets are allocated on entry. The age of entry to Dartmouth has been raised to 16 and the course reduced to six terms. The Admiralty now provides maintenance, tuition, uniforms, and all equipment for all cadets, but parents with sufficient means have to contribute towards the cost of uniform and personal expenses. The maximum rates of contribution during college and cruiser time are £30 a term for Dartmouth cadets and £50 a term for Special Entry. The maximum cost to parents is therefore £240 or £150. The parents of a Dartmouth cadet who would have paid full fees and provided uniform under the old rules thus save something of the order of £300 during the period of their son's cadet training. The parents of a Special Entry cadet save comparatively little, however, for under the old rules they had only to provide uniform and personal expenses, towards the cost of which they now contribute.

In his statement Mr. Walter Edwards, the Civil Lord, said:

The new system of entry and its examination have been designed to ensure that no boy is prevented from competing by reason of his social status, school, or financial standing. I also stress that the Navy must have officers of high academic attainments and high qualities of character and leadership. In determining the details of the scheme, the Admiralty has had full discussions with the Ministry of Education and other responsible educational authorities and associations and has taken the opinion of eminent Naval officers.

In initiating this new scheme, my noble Friend and the Board of Admiralty are confident it will achieve the important objective in mind, that is to maintain the high standard and long tradition of service in the Royal Navy while offering full opportunity to the best and brightest boys from all walks of life whatever schools they may be attending.

Neither in the questions which followed the statement nor in the references to the new scheme in the Navy Estimates debate, was there any

* The Direct Entry, by which cadets from the Merchant Navy training ships and Pangbourne Nautical College may become Naval cadets under special rules, has always been grafted into either the Dartmouth or Special Entry. The numbers concerned have always been small, and the entry, though valuable, hardly constitutes a separate system.

cavilling at the ideals set forth by the Civil Lord. As long ago as 1903 Lord Fisher was much concerned that in the Selborne scheme officers would "be drawn exclusively from the well to do classes." And he asked, "Is it wise or expedient to take our Nelsons from so narrow a class?" And in 1912, about the same time that the Custance committee was seeking ways to improve the number and the quality of candidates for cadetships, Mr. Churchill introduced the mate scheme for promotion from the lower deck, and in the course of his speech said, "These are the days when the Navy . . . should be opened more broadly to the Nation as a whole."

Everyone agreed with the purpose of the new scheme; they were concerned only about its chances of success. The most potent fear, briefly mentioned in the House but discussed more fully in the Press, was that the age chosen would not suit the state grammar schools or the public schools because it would be too early. It might suit the technical and modern schools; but, under the new Education Act, boys of the calibre required should be in the grammar and not in the technical or modern schools. Despite these fears the general feeling was that only time could show whether the scheme was well conceived or not. The first midshipmen trained under the new rules only joined the Fleet in May 1951, so it will be a few years yet before any considered judgment can be given. It is, however, a little disquieting to learn from answers to parliamentary questions that although the number of candidates has been large there have not been enough of the right quality to fill all vacancies. It is to be hoped that recent modifications, by which candidates may offer a wider choice of supplementary subjects in the examination, and may make two attempts, will improve the situation.

SHORT SERVICE COMMISSIONS FOR NAVAL AVIATORS

About the same time as the changes were made at Dartmouth their Lordships re-introduced a scheme for short service commissions for pilots and observers on very much the same lines as those offered in the air branch before the war, the branch itself having been merged in the executive branch in 1948. Partly because it is a short-service scheme, which leaves those who are not granted permanent commissions with the problem of finding a new career when they are about 27, the scheme did not at first attract enough candidates of the right sort. Lately there have been signs of considerable improvement, but whether this is due to better recruiting publicity, the increased rates of flying pay and of gratuity, or to the war news from the Far East, it is hard to say.

THE PRESENT

To-day the normal way to become a Regular Naval officer in the executive, engineering, or supply branches is to enter as a Dartmouth cadet at 16 or as a Special Entry cadet at 18; cadets for the electrical branch, who are entered once a year with the Special Entry in the autumn term, may be between 17 and 19. Executive officers and a small number of engineer officers, who enter as cadets, may specialise in Naval aviation; but the majority of Naval aviators enter for short service between the age of 17 years 8 months and 20. Their chances of being able to transfer to

the permanent list would seem to be good, and this may well become a recognised way of gaining a Regular commission.

Those who make up their minds late can become Regular officers after taking their degrees or qualifying in their professions. Instructor, medical, and dental officers all join at this stage, and so, of course, do chaplains; but it is also possible to join both the engineering and electrical branches after leaving the universities. Officers who enter in this way find themselves a little older than their contemporaries in rank. In general the arrangements for short service commissions and for university entrants are much the same in all Services; it is in their methods of dealing with cadet entries that there are the greatest differences.

CADET ENTRIES COMPARED

There are no exact equivalents in the other Services for the 16-year-old entry cadets at Dartmouth, who are not legally in the Navy until they join the training cruiser; or for midshipmen who, although serving officers, hold neither commissions or warrants. Special Entry cadets and all Naval cadets in the training cruiser are approximately equivalent to cadets at Sandhurst and Cranwell; but there are notable differences.

Candidates for Naval Special Entry cadetships, for Sandhurst, and for Cranwell all take the same Civil Service Commission examination, and those who qualify have then to pass the interview or selection boards of their respective Services. Those who join the Army or Air Force then do their initial training as "other ranks" before becoming officer cadets, whereas Naval cadets are embryo officers from the start. This operates to the financial disadvantage of the Naval cadets and their parents. For under the new scheme the Naval cadet may cost his parents a considerable sum, while the Army and Air Force cadets, by the formality of going through the ranks, cease to be a charge on their parents and, throughout their training, draw nearly twice as much pay. This is a curious anomaly.

PROMOTION FROM THE RANKS

In the Army and Air Force most promotion from the ranks is by appointment to cadetships. Because all entrants to Sandhurst and Cranwell do their basic training before becoming officer cadets the courses are designed to make intelligent trained men into officers. In the Navy the whole of cadet, midshipman, and acting sub-lieutenant time is primarily for the training, education, and up-bringing of young officers, and the fact that as midshipmen they fill complement billets in their ships is merely incidental. Cadetships in the engineering and electrical branches are given to selected Artificer Apprentices, who can start at the same age as those who enter direct from school; but in the Navy cadetships would be quite inappropriate for the rather older ratings who, after a period of normal lower-deck service, show themselves likely to make good officers. For such candidates for commissions, the "Upper Yardmen" scheme provides. Suitable candidates are recommended by their commanding officers, and if they pass the Fleet and Admiralty Selection Boards they go to the Upper Yardmen's College: H.M.S. Hawke in the grounds of the Royal Naval College, Dartmouth, where they are given a year's course.

On passing out from there they become acting sub-lieutenants and join the cadet entry officers for the final stage of their training.

NATIONAL SERVICE OFFICERS

Although the Navy has a very small National Service element it is of high quality, and selected National Servicemen can become R.N.V.R. officers by going through courses as National Service Upper Yardmen. Executive and supply branch candidates are recommended, tested, and interviewed in the same way as Regular Upper Yardmen. Those selected are given a fifteen weeks' course, executive in the training squadron and supply at H.M.S. Ceres, the school of the branch in Yorkshire. Candidates for the air branch, which remains separate in the R.N.V.R., are normally pre-selected, but may volunteer during their first three months' service. Their course in the training squadron is only eight weeks and their subsequent training is the same as that for other pilots and observers. University graduates in mechanical or electrical engineering may be pre-selected for the engineering and electrical branches. They do the ordinary basic training of ratings of their branch followed by a sixteen-week course at the appropriate school.

At the end of their Upper Yardmen's courses all who pass become Temporary officers in the R.N.V.R. and complete their full-time training. They are then attached to R.N.V.R. Divisions or air stations and, while their part-time obligation lasts, have to do a certain amount of training. If they volunteer, and are recommended by their R.N.V.R. division or squadron commanding officer, they may be transferred to the permanent list of the R.N.V.R.

THE FUTURE

During the two hundred and seventy-five years since Mr. Pepy's day there have been many changes in the recruitment and training of young officers. At first all was haphazard, but by the middle of the last century a system had been organised, and later developments have been intended to raise the number and quality of candidates and improve the training. The intentions have been excellent, but, as many committees found, they have not always been achieved.

Expert committees make their reports to the Board of Admiralty, but their Lordships are responsible, through the First Lord, to Parliament, and what they do must be agreeable to the House. The King's Letter Boys, the Naval Academy, the Britannia, the Selborne scheme, the Special Entry, and the new arrangements at Dartmouth have all in their turn been accepted by Parliament. Sometimes, as we have seen, the schemes have been modified in the light of experience. In the Britannia days the age of entry and length of course were varied; in the Selborne scheme the age of entry was changed and the common training of all branches dropped; and between the wars the training cruiser was first abolished and then restored. The Naval training system is not static, it evolves with the Navy, with the general trend of national education, and with political atmosphere; it will be very interesting to watch developments during the next few years.

MENTOR

CHAPTER XVI

THE POTENTIAL MENACE OF THE SEA-MINE

THE ESSENTIAL difference between the minefield and other maritime weapons is that the effectiveness of the latter is in the final analysis dependent on the skill of those who man the craft from which they are launched. The minefield, on the other hand, is normally a static weapon *to which an enemy ship must come* if she is to be sunk or damaged.

The effectiveness of a minefield is thus primarily dependent on the ability of those who plan both its position and its make-up, and it is only in rare cases that the commander of the individual minelayer, be she ship or aircraft, can exercise his skill in the matter.

Although it may on occasion be possible for a minefield to be laid as a tactical manœuvre, it is proper to describe the conduct of a minelaying campaign as strategic in concept. Such minelaying, moreover, must not only be related to the general strategy in any particular theatre of war but must form an integral part thereof.

The mine, in the sense of an immobile underwater explosive charge designed to fire on being struck by a ship, first appeared in practical form in the War of American Independence, but it was not until the Russo-Japanese War that its potentialities in the open sea were exploited. In that campaign the Japanese lost by mining two battleships, four cruisers, two destroyers, and one torpedo-boat, and the Russians one battleship, one cruiser, two destroyers, a torpedo-boat, and a gun-boat.

These results not only focused world attention on the operational value of the minefield as a naval weapon but caused the legality of this form of warfare to be called into question, particularly with regard to the rights and safety of neutral shipping. The approach of individual governments to this problem varied according to their geographical position, their political ambitions, and their grading as maritime powers. The matter was hotly debated at the Hague Peace Conferences in 1907, and there emerged the VIIIth Convention—"Relative to the Laying of Automatic Submarine Contact Mines."

It would be both tedious and unprofitable to discuss this remarkable piece of legislation, but it remains the sole international instrument dealing with mine warfare. It is, on the other hand, of some practical importance to note the general policy adopted by the principal powers prior to 1914. Both Germany and Russia determined on the employment of mines to the fullest possible extent and embarked on well-conceived programmes of material development. France displayed no particular interest in the subject, but developed several different types of mines. Italy showed some ingenuity in the design of mining material, but did not formulate any settled policy for its employment. Japan, somewhat curiously, in view of her shattering experience in the Russo-Japanese War, did practically nothing, while both on ethical and political grounds America foresaw little use for mines except for the close defence of her harbours, an aspect of the subject with which this article is not concerned. Great Britain pursued

a policy of vacillation, largely influenced by a dictum of Earl St. Vincent in 1804 to the effect that "Pitt was the greatest fool that ever existed to encourage a mode of warfare which those who commanded the seas did not want, and which if successful would deprive them of it."

The result was that we in this country started World War I under a material handicap, but our inherent skill both in the sphere of engineering and of seamanship served to close the gap. The total Allied and enemy mining losses in World War I were well over 1,000 vessels of various types, and the weapon had clearly come to stay.

Between the wars development of mining material both in Germany and Great Britain continued with the advantage from our point of view that in this country a serious study was made of the principles underlying the correct *employment* of that material. The efforts of British designers were thus directed to the provision of types of mines best calculated to meet the stated strategical and operational requirements.

The latter point is of importance, because it renders inevitable the inclusion of technicalities in this review. It is probable that of all forms of warfare the conduct of a minelaying campaign calls most vehemently for a knowledge on the part of the planner of the capabilities and limitations of the material at his disposal, and on the part of the designer for a complete and realistic appreciation of the needs of the planner. The scientist, in short, must be fully in the operational picture, while the operational authority must be able to speak the language of the scientist.

We can now turn to a consideration of the main technical points.

MINES

All mines fall into one of two main categories :

Contact Mines. These fire on being struck by a ship, and are thus unique in being capable of definition in words of one syllable. Reference must, however, be made to a special form of contact mine known as the "antenna," which fires if the hull of a steel ship or submarine touches a thin wire supported above the mine on a float, or that part of the mooring rope just below the mine. The advantage of this type as an anti-submarine weapon is that it endangers a greater vertical area than does the plain contact mine, and is thus more economical than the latter in so far as the *number* of mines required is concerned. But the explosive charge in the antenna mine must be larger, in order to ensure a worthwhile effect in cases where the submarine makes contact with either extremity of the antennæ, i.e. at some distance from the mine itself.

Influence Mines. These mines fire on a ship approaching within a given distance, owing to some phenomenon connected with that ship. The principal phenomena so far exploited with any success are magnetism, noise, and pressure. Every steel ship possesses some magnetic properties, and these can be used to provide sufficient electrical energy to operate a relay in the mine and so to complete the circuit between the firing battery and the detonator. Similarly, every ship transmits a certain amount of noise through the water, which by means of a vibrator or other suitable device can be used to operate the firing relay. Thirdly, the movement of any body through the water results in a reduction of pressure on the sea

bed. In comparatively shallow water this reduction of pressure is sufficient to operate the firing mechanism of a mine.

Mines can also be classified according to the position which they take up on being laid, i.e. :

Buoyant (or Moored) Mines. These mines are anchored at a predetermined distance beneath the surface of the sea by means of a wire and 'sinker.' The latter may act as a trolley for launching the mine from the minelayer, and mines of this type can be actuated by contact or by influence methods. In strong currents moored mines tend to "dip" below their set depth : so there may be periods during which ships which might otherwise have been struck can pass over a minefield in safety. Moreover, the effectiveness of such mines against surface ships of a given draught depends on the state of the tide. Many ingenious but fruitless attempts have from time to time been made to produce "tide-compensators," designed to keep moored mines at a fixed depth beneath the surface, but in fact the only measure that can usefully be adopted is to fit an influence firing mechanism. This at least provides that a ship which might otherwise have passed over the mine in safety will run the risk of detonating it and incurring some damage.

Ground Mines. These remain permanently on the sea bed, and can therefore be actuated by influence methods alone. In consequence, the explosive charge must be considerably greater than that required in a contact moored mine, and there is clearly a limitation to the depth of water in which it is worth while laying ground mines at all. Against this, the ground mine cannot by definition "break adrift," and, as will be seen later, it can be made far more difficult to counter than the moored type.

Drifting Mines. The essential feature of these mines is that they are "free," and at any given moment their position relative to that in which they are laid is determined by the prevailing conditions of sea and wind.

Normally, drifting mines remain floating on the surface, or they are suspended below the surface from a small baulk of timber. There is a specialised form of drifting mine, known as the creeping mine, which is kept below the surface by means of a length of chain dragging along the sea bed, while finally there is the more elaborate oscillating type, in which a source of energy such as compressed air, gas, or electricity is used to maintain the mine somewhere near a pre-selected depth below the surface. Apart from the fact that under the provisions of the Hague Convention the active life of all forms of drifting mine is limited to one hour, they have an unpleasant habit of proving more of an embarrassment to oneself than a danger to the enemy.

It should be noted that we are not concerned here with the "controlled" mine, operated from the shore for harbour defence purposes, nor with the "Limpet." The latter is an explosive charge deliberately fixed to the hull of a selected enemy ship in the course of clandestine operations by midget submarines or similar craft. It is, in fact, an aimed weapon, whose success is wholly dependent on the skill and courage of the individual attacker.

MINELAYERS

It is true to say that almost any type of craft, whether she be surface ship, submarine, or aeroplane, can be adapted to lay mines of one sort or another.

Whether or not it is the better policy to convert existing ships for minelaying duties or to design and build ships specifically for that purpose must depend on a variety of circumstances with which we are not concerned, but it may be noted that there is in this country generally some reluctance to spend money on highly specialised ships which do not in times of peace represent an obvious and tangible return for the expenditure involved. In the long run, as always, it is a question of how best to achieve the object in view, and it is therefore worth while to consider the capabilities and limitations of various types of minelaying craft.

For the laying of protective minefields in waters over which the laying side exercises control it is generally accepted that mine-carrying capacity is of more importance than high speed or endurance. From this it follows that the converted commercial vessel is suitable, provided always that she is not so large as to present berthing and handling difficulties at the mine-embarkation ports, and is not of too deep a draught to operate in coastal waters. Thus ships of the train ferry and car ferry type are simple to convert and have in the past proved most successful.

For minelaying in enemy waters mine-carrying capacity is regarded as of less importance than the power of evasion. Whether the latter be conferred by high speed, small silhouette, or the ability to submerge depends on the type of vessel employed, but as a general rule the converted cargo or passenger vessel is unsuitable for this purpose. Notable exceptions to this rule were the *Princess Margaret* and *Princess Irene*, adapted to lay mines in enemy waters in World War I, but these ships were of a special type designed for the run between Seattle and Vancouver.

Considerable and effective use has been made of converted light cruisers, destroyers, and coastal force craft. The latter, in spite of their small mine load, can be of great value in waters restricted by sand banks or other navigational hazards. Apart from the cruiser-minelayer *Adventure*, a not altogether successful hybrid built in 1922, the only surface ships ever to be designed and built for the Royal Navy specifically as minelayers were the six 'Abdiel' class of fast minelayer. These magnificent craft, with a comparatively small silhouette, a speed of thirty-nine knots, a load of 160 mines, an adequate gun armament, and the most up-to-date navigational and radar equipment, proved to be invaluable in World War II. At the present three only remain to us, the *Manxman*, *Ariadne*, and *Apollo*, and it has been announced that two of these ships are being brought forward from reserve in the current year.

The submarine minelayer, requiring neither escort nor support when operating in enemy waters, and being capable of carrying out her own reconnaissance, represents the rare case of the commanding officer being able on occasion to exercise his own judgment and skill in the placing of his mines. Nearly all maritime powers interested in minelaying have from time to time adopted the threefold policy of building submarines designed as minelayers, of converting existing submarines to lay mines through vertical tubes cut in the saddle tanks, and of producing mines capable of being ejected from the torpedo tubes of standard submarines.

The British 'Porpoise' class of six ships, specifically designed to carry fifty buoyant mines of a type similar to those laid by surface vessels, were representative of the first category, as were the French minelaying submarines of the 'Rubis' class. The former, of which none now remains,

were successfully employed in various theatres in World War II, although somewhat unwieldy for operations in Northern European waters. The latter, represented by the Rubis herself, with a load of thirty-two mines, did most valuable work.

It was, however, the advent of aircraft as potential mine-carriers that had the most marked effect on the conduct of operations in enemy waters. Aircraft can not only lay mines in areas which are inaccessible to other types of minelayer, they can revisit these areas and keep them "topped-up" without the risks attached to the surface or submarine minelayer in attempting such reinforcement.

In World War II Germany for a period made comparatively heavy aircraft minelaying raids against British ports and coastal channels, but a general lack of operational *savoir faire*, and jealousy between the German Navy and the Luftwaffe, robbed these efforts of much of their effectiveness.

The Royal Air Force, on the other hand, co-operated to the full in implementing the broad plans drawn up by the Admiralty for the widespread laying of mines. In all, some 55,000 mines were laid by aircraft of Bomber Command, Coastal Command, the Royal Navy, the Royal Canadian Air Force, and the Royal Australian Air Force in various theatres of war, resulting in the mining of over 1,300 ships, including twenty-nine U-boats.

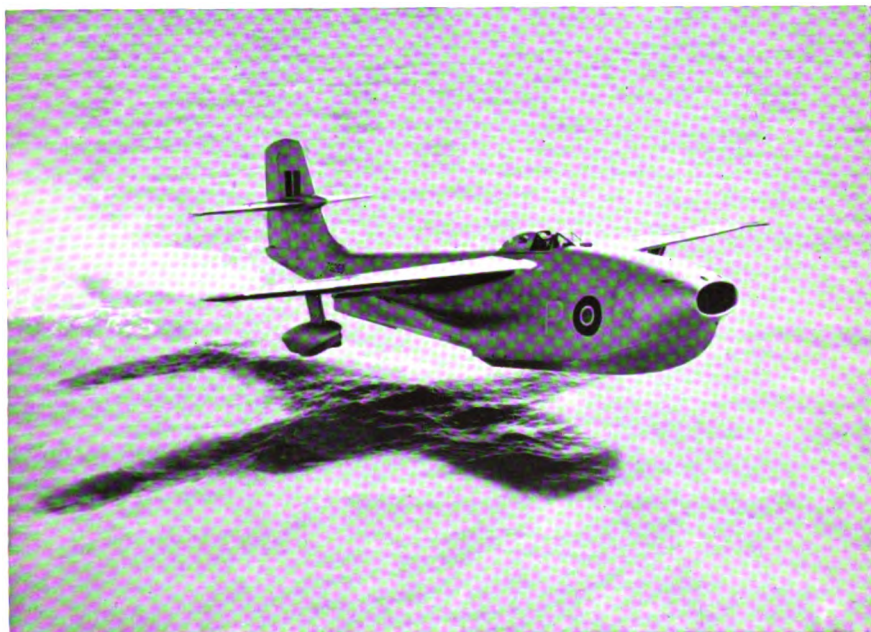
COUNTER MEASURES

In broad terms the sweeping of moored mines is achieved by towing a wire horizontally through the water, either between two ships or out on the quarter of a single ship. In the latter method, known as the "Oropesa" sweep, the wire is diverted by means of an "otter" developed from that commonly used by fishing vessels. The whole problem, indeed, is one of seamanship, employing methods and equipment familiar to the fisherman, and so in the past there has always been a reserve of ships and men capable of turning to minesweeping at short notice. It is, of course, possible to make the task of sweeping more difficult by the incorporation of "snags" or other anti-sweeping devices in the moorings of the mines themselves, or by including a proportion of "obstructors" in the minefield. None the less, the problem remains a simple one in comparison with that presented by the modern influence mine laying on the sea bed.

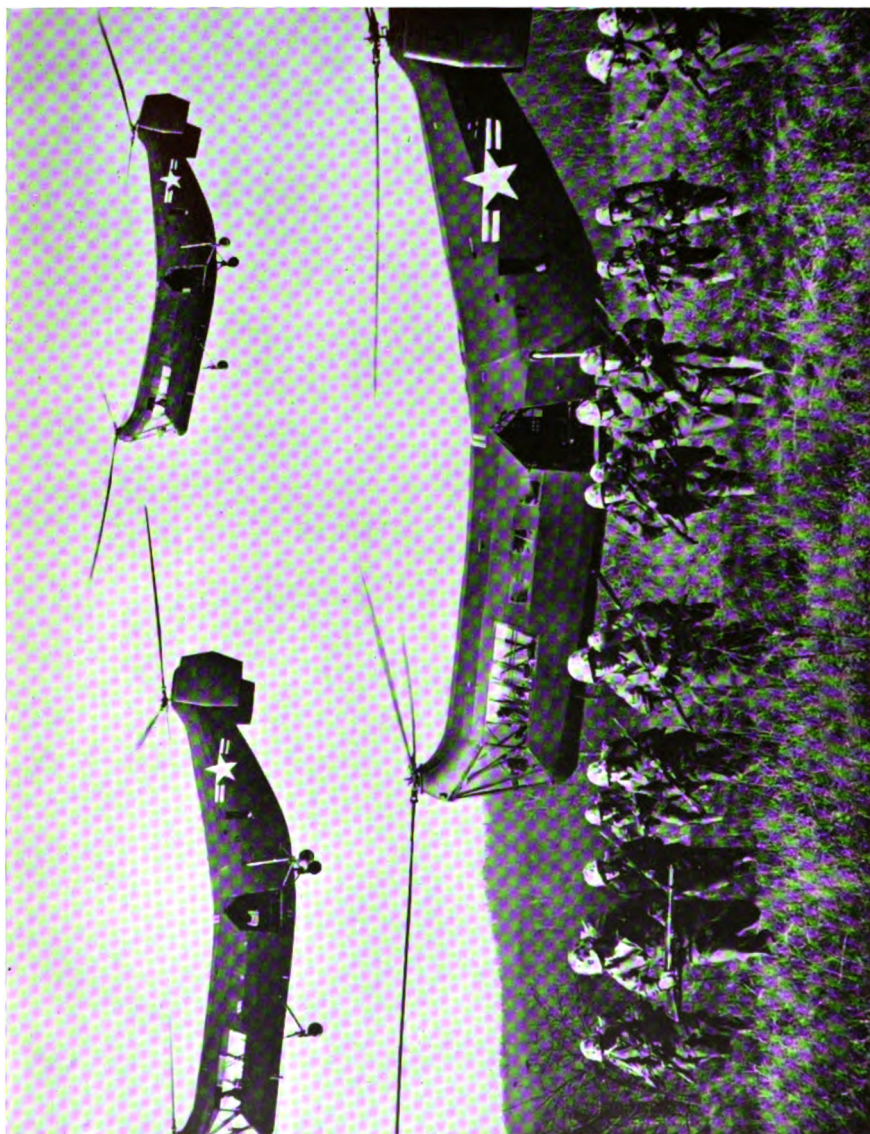
As already noted, such mines may be actuated by magnetic, acoustic, or pressure phenomena. Initially, the problem of detonating such mines (which cannot be "swept" in the sense that the term applies to moored mines) resolves itself into the production of the appropriate phenomenon by artificial means. Thus a cable towed through the water, and carrying an electric current, will actuate a simple magnetic mine, and similarly an underwater noise-making device will deal with a simple acoustic mine. But by employing a combination of these two influences the designer of the mine can produce an actuating mechanism which requires first a build-up of sound comparable to that emanating from an approaching ship, followed at the right moment by a magnetic field similar to that associated with the passage of such a ship. A mine of this type is said to respond only to "full ship phenomena," and the devising of an *artificial* method of detonation by a minesweeper is a matter of considerable difficulty.



Convair XP5Y-1 Flying Boat



Saunders-Roe SR/A1 Flying Boat (jet fighter)



Piasecki PV-3 8-seat Helicopter of U.S. Navy

The pressure mine comprises a technical headache in its own right, because the conditions necessary to cause it to detonate can *only* be reproduced by a ship-like structure. Such a device, possibly towed by a vessel sufficiently small to be immune herself, must either be impervious to explosions or it must disintegrate on detonating a mine in order to avoid fouling the swept channel. Either of these expedients presents problems of handling and is slow and costly.

If all three influences, magnetic, acoustic, and pressure, are used in combination, a truly formidable task may confront the minesweeping force. In addition, mines can be fitted with a delay-action apparatus, so that they remain inert until a pre-set time after laying has elapsed, and they can also embody a mechanism which prevents them from becoming active until it has been actuated by the passage of a predetermined number of ships or minesweepers.

Further complications can be introduced, to which detailed reference cannot be made, but it will be apparent that mine warfare does not merely call for operational ingenuity in the positioning of individual minefields but involves a continual battle of wits between those who design the mines and those who are called upon to produce the antidotes. The modern minesweeper must be equipped with a variety of complex apparatus, with the attendant problems of supply and maintenance, and her company must include a fairly high proportion of skilled technicians. The management of minesweeping resources, however, remains fundamentally a matter of sea-sense, a commodity which is fortunately never in short supply in the British Empire.

In addition to the actual sweeping or detonation of mines, the danger to ships may in certain conditions be materially reduced by the adoption of self-protective measures. The best known of these is probably the paravane, which may be described in simple terms as an "Oropesa" sweep towed from the stem of a ship instead of from the stern, the object being to deflect moored mines from her path and to sever the mooring ropes at a safe distance from the hull. Equally well known is the system of "degaussing," designed to reduce to a minimum the magnetic field beneath a ship. In the case of acoustic mines, an obvious but difficult step is to reduce the noise output of the ship as much as possible; but in the case of the pressure mine the only practicable measure of self-protection is to reduce speed to a figure which varies according to the size of the ship and the depth of water. In certain circumstances this "safe" speed may be as low as four knots, e.g. for ships larger than destroyers in ten fathoms of water.*

All types of countermeasure and of self-protection impose a burden on an enemy, either in terms of material, weight, cost, manpower, or operational delay. A remarkable feature of mine warfare, in fact, is the extent to which the war potential of a belligerent can be seriously affected without actually sinking any ships at all. In addition to the burdens just mentioned there may be noted such things as the diversion of shipping to more vulnerable areas, the overloading of other means of transport owing to the mining of sea-routes, the dislocation of trial and training programmes, and interference with the movements of troops, supplies, and vital raw materials by sea.

* "Science at War." H.M. Stationery Office, 1947.

FUTURE PROSPECTS

As regards the future, the Russians have always shown themselves to be capable designers of mining material, and no doubt they have had some assistance from German technicians. As in other aspects of sea warfare, their ability in the operational sphere is a doubtful quantity. None the less, it has always been their policy to equip every possible type of ship to lay mines, and it would be foolish to expect them to have failed to appreciate the value of aircraft as minelayers.

The sum of all these considerations is that our defence structure, to be properly balanced, must make provision to meet a minelaying threat which might be heavy in the purely quantitative sense, and which would most certainly present technical problems of a progressively complex nature.

As a broad generalisation, it is true to say that it is impracticable to design a mine which cannot eventually be dealt with *by some means or another*, but, as already hinted, the measures required to safeguard communications by sea against this form of attack may impose an extremely heavy burden.

It is suggested that preparations to meet a minelaying threat, and to reduce the initial burden of defence to reasonable proportions, fall under three main heads. First, the provision of minesweeping equipment designed in the light of up-to-date knowledge and with a skilled appreciation of the nature and scope of the potential threat. Secondly, the building and addition to the Fleet of minesweeping craft capable of carrying that equipment, and the training and exercise of officers and men in its operation and maintenance. Last, but by no means least, the intensification of basic research into the various principles which might be employed by the designers of mines.

This "anticipatory research," as it is sometimes called, is of the utmost importance, for it provides a store of basic data which can be unlocked as soon as the method of application of one or more of these principles by an enemy in a "new" weapon is discovered. The collection and analysis of this data is a lengthy and in some respects unending process, and to defer it until the new weapon appears means the imposition of a severe, unnecessary, and possibly fatal handicap.

That the Admiralty is pursuing all three of the foregoing lines of approach is evidenced by the statements in explanation of the Navy Estimates, but the fact remains that the menace is not only a real one but in the opinion of many Naval officers is comparable to that presented by the submarine of the future. In both cases, however, it should be borne in mind that the counter-measures include the taking of steps designed to prevent the opposing forces from ever reaching their objective, while in the sphere of mine warfare it can be claimed with some confidence that we have sufficient skill and experience to throw some peculiarly virulent types of spanner in the war machine of an aggressor.

J. S. COWIE *

- * Author of "Mines, Minelayers, and Minelaying." Oxford University Press, 1949.

CHAPTER XVII

CONDITIONS OF SERVICE IN THE ROYAL NAVY

PAY AND ALLOWANCES

IN THE last twelve months, during which time the Navy has embarked on its programme of expansion, the most important development from the viewpoint of officers and men has undoubtedly been the introduction of improved scales of pay.

The White Papers giving details of the changes were published late last year, and it was not possible to do more than reproduce them at the end of Brassey's 1950 edition, which was already in the hands of the printers. At the time of writing the new scales have not noticeably affected the trend of Naval recruiting, which since the war has always been officially regarded as generally satisfactory to requirements. An improvement should come about as time goes on and the Navy's build-up gets well under way. There can be no doubt that in the long run the new pay scales will be beneficial to the Service.

The young man now joining the Navy is offered a really well-paid career, whose financial rewards compare very favourably—so far as comparison is possible, in view of the many conditions peculiar to a Naval career—with those obtaining in civil employment.

Annual basic pay of a midshipman, sub-lieutenant, and lieutenant of up to four years' seniority in the rank is increased by £82; a lieutenant of more than four years' seniority by £110; a lieutenant-commander by £128; a commander and captain by £146. For example, a commander on promotion now gets £1,013 annual basic pay, a captain on promotion £1,332. Pay for officers of flag rank or its equivalent ranges from £2,190 for a rear-admiral to £3,650 for an Admiral of the Fleet.

This is, of course, *basic* pay. To it are added various allowances, the largest of which is marriage allowance, when it is applicable. This allowance remains unchanged at 18s. 6d. a day for junior officers to 26s. a day for the most senior officers.

On the whole, basic pay increases for other ranks and ratings are proportionately larger than those for officers. They range from 21s. a week for a leading seaman and below to 31s. 6d. a week for a petty officer, 38s. 6d. for a chief petty officer, and 42s. for a sergeant in the Royal Marines.

It is hoped that in due course these adjustments will induce many more men to re-engage at the end of twelve years for a further ten years and thus qualify for a pension.

Since the war the Admiralty has been much concerned by the steady falling-off in long-service engagements. Generally men have chosen to leave the Service while still in their late twenties or thirties and take their chance of finding a well-paid civilian job. Before the pay increases came along so many men were failing to re-engage that there was more than a possibility of the Navy facing an acute shortage of senior ratings in a few years' time. Had nothing been done the position might well have got progressively worse, to the grave detriment of the Navy's efficiency.

The new pay scales, together with a hoped-for improvement in pension rates, should ultimately bring about a change for the better. In recent months there has been a considerable increase—considerable, that is, when compared with the previous low figure—in the number of re-entries into the Royal Navy. Pay has obviously had much to do with this.

PENSIONS

Admittedly, the existing scales of Naval pensions are not good enough in view of the rising living costs and other economic changes that have come about since the war. Men leaving the Service after twenty-two years, at about the age of forty, are eligible for pensions averaging from £1 6s. 4d. a week for an able seamen to £1 13s. 5d. for a chief petty officer. Retired pay for Naval officers range from £375 a year for a lieutenant to £1,500 a year for a full admiral. When not employed an Admiral of the Fleet draws half-pay of £1,800.

The most difficult subject of pension adjustments, which presents a whole series of problems not related to basic pay increases, has been under consideration for some time. Examination of pension scales, with such recommendations as could be made for increases, was among the terms of reference of the Re-engagement Committee. This small committee, which comprised four or five senior Naval officers and a senior Civil Servant, has now sent its recommendations to the Board of Admiralty. Whether its findings will be published is questionable.

The existing pension scales are meagre beside the new rates of basic pay, but the task of making pension adjustments that would bring the two into better relation with each other is beset with difficulties. Should new pension scales apply only to men who will qualify for them in the future? Should they be made retrospective, and, if so, to what extent? These are two of many questions which must be answered before a change can be made.

In normal peace-time conditions about 1,000 officers and men who have served their full time in the Navy are added to the pension list each year. The number may seem small when compared to the Navy's total manpower. But it must be remembered that the figure is accumulative and the annual additions would with pensions increases become a heavy extra burden on the taxpayer in the course of a few years. And, of course, the amount would be increasing steadily all the time.

Because of the call-up forced upon the Admiralty last year by the outbreak of the Korean war, all time-expired men are retained in the Navy for a further period of eighteen months. This was one of the measures necessary to put the Far Eastern Fleet on a war footing without reducing normal peace-time tasks on other stations. Admiral of the Fleet Lord Fraser, the First Sea Lord, regretfully announcing this change, said that men with twenty-two years' service would receive a slight addition to their pensions when they were released.

SERVICE ASHORE AND AFLOAT

With the steady expansion of the Navy, the increase of manpower, the bringing of nine ships from reserve, and the progress of the new con-

struction programme, the living conditions of men serving afloat and on shore continues to improve.

According to the present plans, no fewer than 232 ships are to be built within the next three years. About 200 of them will be minesweepers of various kinds. Six will be carriers, two of them the *Eagle* (due to be commissioned this autumn) and *Ark Royal*, both of 36,800 tons; and four—the *Albion*, *Centaur*, *Bulwark*, and *Hermes*—intermediate fleet carriers displacing about 18,000 tons each.

Among the ships which at the time of writing are nearing completion are eight big destroyers of the 'Daring' class. When the seventh of them, the *Duchess*, was launched in April at Messrs. Thornycroft's Woolston yard, Vice-Admiral the Earl Mountbatten of Burma, the Fourth Sea Lord, reminded the guests that these ships were, in effect, not destroyers but light cruisers. Living conditions on board will be unsurpassed by those in any warship yet afloat. Amenities include florescent lighting in accommodation spaces, all-electric cooking, a modern laundry, a modern bathroom with stainless steel basins, and labour-saving devices for use in cleaning ship.

Such improvements apply to most, if not all, of the larger warships now being built. Sleeping accommodation is also receiving consideration. At least one of the new ships may be equipped with portable beds in place of the traditional hammocks.

In the original Navy Estimates for the financial year ending March 31, 1952, the allocation for scientific research was the largest since the war. Although most of this money is being devoted to weapon-development, particularly to weapons and other equipment intended to counter the menaces of the mine and fast submarine, an appreciable part of it is earmarked for research to better the serving conditions of all officers and men.

More medical tests have been carried out during the year to determine the most efficient types of cold-weather clothing and the most suitable diet for given conditions. Many other experiments have been made which also have a bearing on the endurance, well-being, and efficiency of men liable to be called upon to serve in any climate.

One of the most interesting tests conducted by Naval medical officers this year was designed to find an answer to the old question of how to prevent sea-sickness.

This experiment was not without its lighter side. Looking round for volunteers who, nautically speaking, were not too "case-hardened," the Admiralty called in sixty-five Guardsmen. The men were marched to a fairground, where they cheerfully submitted to a long free ride on a roundabout. They were whirled round continuously for half an hour, an experience which most of them enjoyed. Not so the medical observers, however. After watching the men's reactions with a strictly professional eye, they had to admit that this part of the experiment was a failure!

A few days later sixty-four other soldiers, again all volunteers, underwent a sterner test. On six separate days they were taken out in parties and were tossed about in a rough sea off the Isle of Wight. This time the conditions were all that the medical officers could desire. The sea was so rough that the original plan of putting the men on rafts had to be abandoned; instead, they went out in two coastal motor boats.

Each soldier was required to make a four-hour trip on four different

days. While at sea he was kept below decks, out of sight of the steady horizon, and was not allowed to smoke or to talk unnecessarily. Each time out he was given an "anti-seasickness" capsule.

All these capsules were unlabelled and looked exactly alike. The first contained hyocine, a drug used for sea-sickness during the war; the second and third were filled with unnamed drugs; the fourth with sugar only.

Presumably the observers regarded the results of these "trips round the bay" as satisfactory, but at present they are not making their conclusions public. More tests are now being held to determine dosages of the most suitable drug—which might well be a combination of the three used off the Isle of Wight.

Planned by Professor McCanie, of Cambridge University's Department of Experimental Medicine, these tests yielded valuable information that should help to increase the chances of men who may have to take to boats or rafts after a disaster at sea. Sea-sickness tests are part of the comprehensive survival trials the Navy holds from time to time in home, tropical, and arctic waters.

The tragic loss of the submarine *Affray* which in April failed to surface after diving in the Channel with seventy-five officers and men on board, has focused public attention recently on another aspect of research for the safety of naval personnel at sea.

Much research has been devoted lately to improving escape apparatus in submarines. When the *Truculent* sank after a collision in the Thames at the beginning of 1950, distribution of new-type immersion suits to the crews of operational submarines was just beginning. These suits, which incorporate the Davis escape apparatus, increase considerably the chance of survival of men leaving sunken submarines. During the past year all the sea-going boats have been supplied with this equipment.

Other research concerned with the safety of submarine crews has led to the development of a "radio" marker-buoy which is undergoing sea trials. Upon the buoy reaching the surface a telescopic mast is extended automatically and a radio set in the buoy begins to transmit signals giving the sunken submarine's position.

NAVAL AVIATION

Naval aviation is now perhaps the most rapidly growing branch of the Navy. Its importance has been repeatedly stressed by the Admiralty in public pronouncements over the past year. As the time approaches for the new carriers to come into service, the routine of the active carriers have been reorganised to accelerate training. There is greater activity on the Naval air stations and the Navy's first-line squadrons are being re-equipped with jet aircraft. All this means that more and more officers and men will be wanted for air duties. Recruiting for Naval aviation is now a top priority.

The number of pilots now available and under training at present falls far short of potential requirements. The existing shortage is, in fact, causing the Admiralty much anxious thought. As yet the schemes launched during the last year or two have not achieved the results hoped for them. Only one looks promising—that for training National Servicemen as pilots. This particular scheme is discussed later in the chapter.

Vice-Admiral M. J. Mansergh, the present Fifth Sea Lord, referred to the dearth of Naval pilots during a lecture he gave recently to the Royal United Service Institution. In considering the recruitment of officers as aircrew, he pointed out that the promotion pyramid would be flattened, and the career factor lowered too much, if the Navy offered a permanent career with reasonable prospects to an unusually large number of junior officers. He put forward as the ideal arrangement a mixture of short-service and long-service officers.

Up to the present this ideal has proved elusive. A short-service scheme which the Admiralty introduced early in 1949 was intended to persuade young men to enter Naval aviation as cadets between the ages of 17 and 21 (now increased to 24) and retire after eight years to the Emergency List with a substantial gratuity. The response has been disappointing. And the position as it affects the supply of Naval pilots is not helped by the reluctance of general service officers to specialise in aviation, and the steady "wastage" as war-time pilots who took extended commissions reach the end of their time.

Why this lack of candidates for Naval aviation? "While no one thing can be blamed, there is little doubt that the financial aspect is a powerful consideration," says Admiral Mansergh. "We hope that the recent good increase in flying pay and the increase in the gratuity will have a beneficial effect on the recruitment of aircrew."

Flying pay, which is, of course, additional to ordinary pay, now ranges from £128 a year for an acting sub-lieutenant to £219 for a lieutenant with two years seniority and for a lieutenant-commander. Whereas a lieutenant-commander has command of a squadron, the duties of commander (Air) and captain are administrative. The flying pay of these more senior officers is less. It amounts to just over £90 a year.

An all-round increase of gratuities payable at the end of short-service commissions also applies. All new-entry short-service pilots now get at the end of their eight years a gratuity of £1,500—more than double the old figure.

NATIONAL SERVICEMEN

The increase of the National Service period from eighteen months to two years, a measure which became effective last autumn, is having little influence on the manpower position. The Navy continues to take a token number of these men—about 2,000 a year. It may, of course, be necessary to increase this figure with the advancement of the Naval expansion programme, and should the international situation remain difficult.

Retention of National Service men for a further six months goes some way towards meeting a need of which the Admiralty has been conscious since the Act was introduced in 1946. It had long been felt that eighteen months was too short a time for any really worthwhile training to be given, in view of the special conditions applying in the Service. Most Naval officers consider two years to be the minimum for such basic training.

With very few exceptions, National Servicemen accepted for the Navy must belong to the R.N.V.R., the R.M.F.V.R., or the R.N.V.(W.)R. A youth who prefers to serve in the Navy joins one of these Reserves approximately twelve months before he is due for call-up. If he reaches the

required standard of efficiency during that time, and has completed the specified number of drills, his acceptance by the Navy for full-time National Service is guaranteed. The longer spell in the Service now makes it possible for more time to be spent at sea, either in home waters or on foreign stations.

Of great interest to young men who are keen on Naval flying, and who wish to obtain a commission during their National Service, is the Admiralty scheme whereby National Servicemen can be trained as pilots or observers. They are entered as Naval airmen, and after a short period of general Naval training are promoted to midshipman (1) R.N.V.R. and begin flying training. During the full-time National Service they are brought up to "wings" standard and given some instruction in operational flying duties. After the two years the men are expected to join one of the five R.N.V.R. air squadrons, the purpose of the scheme being to provide replacements for the war-time pilots who are still manning them.

After getting off to a slow start, the scheme is now getting under way. By the end of this year the first two batches of the new pilots will have completed their full-time National Service and entered one of the R.N.V.R. squadrons for further part-time training. It is encouraging that more young men are offering themselves as candidates for aircrew as the months pass.

THE RESERVES

The position of Naval Reservists has been affected by the present call-up and increasing training commitments.

When the Korean war began an increase in the Navy's manpower became immediately necessary. This applied especially to technicians. Not only did the Admiralty have to retain in the Service time-expired men (thereby adding about 2,000 to the strength every three months), but it decided to call up some Reservists.

Accordingly, 6,000 men have been recalled from the Royal Fleet Reserve, and 600 officers on the Emergency List and other Reserves have been asked to volunteer their services. Most of the men in the R.F.R. have joined it for five years after completing seven years in the Fleet. Those recalled began to report to the depots last April.

Training for R.F.R. men generally has now been resumed. "Refresher" courses have been introduced for selected retired and Emergency List officers and members of the R.N.V.S.R. This Reserve consists of temporary officers who normally do no training, but have promised to "stand by" for any emergency. Normal R.N.R. training has also restarted.

The first of the R.F.R. courses began last November, and by the end of March some 2,000 men had received instruction. It is expected that the rest of the 25,000 in this Reserve will have done their training by the end of next year. The earlier courses have been largely for those Reservists who previously served in branches now obsolete, and for those who were in branches—such as Naval aviation—which have been reorganised during the last few years.

For some months past training for the defence of merchant ships in war has also been receiving considerable attention. Officers and men in the Merchant Navy number about 145,000: all, if they wish, may attend the defence courses which have been going on since last January.

Resembling the courses held just before and during the last war, they have been prepared by the Admiralty in consultation with the Ministry of Transport and representatives of various Merchant Navy organisations. The instruction is intended chiefly for officers and men who were not at sea between 1939 and 1945. It can be taken either in one period of ten days or in two periods of five days, attendance being voluntary, and open to all masters, officers, and men of British nationality provided they are not members of the Armed Forces Reserves. Courses are held at centres in London, Liverpool, Glasgow, and Newcastle-on-Tyne. Men attending at these centres, and who will attend others being opened elsewhere later this year, are paid travelling expenses for distances up to fifty miles from a centre, and receive certain other allowances.

Main objects of the scheme, says the Ministry of Transport, are to give knowledge of the general principles on which the Royal Navy bases its system of trade defence, particularly the procedure for sailing in convoy; and to train men to use defensive equipment so that a merchant ship can give a good account of herself against underwater, surface, or air attack.

"WAVY NAVY" STRIPES TO BE ABOLISHED

Pursuing its policy of bringing Reserve officers more into line with their professional colleagues, the Admiralty announced this year that certain changes would be made in distinguishing marks of rank. These alterations, which are expected to become effective during the winter months, are being brought about because of the wide variety of technical knowledge now demanded of both Regular and Reserve officers. The Admiralty believes it is no longer expedient to make any considerable distinction between the two.

The interwoven lace of the R.N.R. and the "wavy" stripes of the R.N.V.R. are to be abolished—except, in the case of the R.N.V.R., for officers of the Sea Cadet Corps and the Combined Cadet Force.

Qualified officers of the Reserves—"officers qualified in every way to accept the responsibilities of their professional colleagues in the Royal Navy," is the official definition—will in future wear the regular straight stripes and curl. All other Reserve officers are also to wear straight Royal Navy stripes, but there will be variations in the curl to denote status.

Those officers of the permanent R.N.R. and R.N.V.R. who are not fully "qualified" will wear the regulation Royal Navy curl, but with the letter "R" inside it. Air Branch officers of these Reserves will wear an "A" instead of "R."

Temporary officers will, however, wear a "wavy" curl, air officers being distinguished by an "A" like their opposite numbers in the permanent Reserves.

News of the impending changes had a mixed reception. Some members of the R.N.V.S.R. who served in the R.N.V.R. during the war heard with regret that the "Wavy Navy" stripes of which they are so proud are to go. Others, considering themselves well "qualified" by experience, suggest that should an emergency occur in the next few years they might find themselves in the position of having to wear stripes "junior" to those of much younger officers who joined the R.N.V.R. on completing the post-war National Service.

As the reorganisation was considered for many months before the Admiralty announcement, such points have not been overlooked. At the beginning of any future wide-spread hostilities, some such anomalies might well be unavoidable for a short time. I am reminded of the case of some newly commissioned R.N.V.R. officers who early in the last war were appointed as minesweeping unit officers. For a few months they sailed with seasoned skippers who commanded fishing vessels converted for minesweeping duties. It was an uneasy compromise which sometimes gave rise to misunderstanding on questions of command. The arrangement came to a natural end when the newcomers were fully trained.

The Women's Royal Naval Reserve, the smallest of the women's auxiliary forces, is now establishing its own active Reserve. Like the R.N.V.R., the new W.R.N.V.R. will receive annual training. The existing W.R.N.R. is in effect an Emergency List of former officers and ratings willing to rejoin the "Wrens" in time of war.

NOWELL HALL

CHAPTER XVIII

THE ARMY SEEN FROM PARLIAMENT

(MARCH 1950 TO APRIL 1951)

IN MARCH 1950 Mr. John Strachey, Secretary of State for War, introduced Army Estimates involving a reduction of expenditure of £6 million compared with the previous year and a decline of 20,000 in the manpower strength from the estimated April strength of 364,000 men. The Minister of Defence had previously reported to Parliament (Cmd. Paper 7895): "The Army is still called upon to fulfil wide commitments all over the world, and to some extent therefore the provision of the most modern equipment for future use must yield to the urgent present need for trained men."

Those wide commitments included the maintenance of a substantial force in Hong Kong, fighting against bandits in Malaya, the Suez Canal base and other garrisons in the Mediterranean and Middle East area, occupation duties in Trieste, Austria, and Germany, in addition to the responsibilities for home defence and for the defence of Western Europe which Great Britain has undertaken in the Brussels Pact and the North Atlantic Treaty. No official estimate was then given of the number of divisions or brigades, but subsequent statements indicate that there were then two divisions and a brigade in Germany, one division in the Mediterranean and Middle East area, and elsewhere approximately eight brigades, including one at home, many of which were not immediately prepared for operations.

A year later the same Secretary of State for War was asking for an increase in expenditure of £120 million, or 40 per cent., and warned the House to expect a large Supplementary Estimate later in 1951. Numbers of men in the Army had risen above, instead of falling below, 350,000. Three new divisions had been created, of which one had gone to Germany and two were forming in England; two brigades were fighting with the United Nation forces in Korea. This had been done whilst fighting continued in Malaya, the threat to Hong Kong had increased, occupation duties in Austria and Trieste remained, and the need for troops in the Middle East had increased.

The Reserve Army had not yet been strengthened to the same extent, but steps have been taken to recall approximately 200,000 men of the Class "Z" Reserve to serve with T.A. units and some units of the Active Army in preparation for a speedier mobilisation of four of the twelve proposed T.A. field divisions of the Anti-aircraft defences of Great Britain and of certain administrative units, the immediate availability of which would be vital in operations to our troops overseas.

The reasons for this transformation in the Army's strength are well known. Historians may later make caustic comments upon British statesmanship which in successive breaths, taken in the autumn of 1950, first acknowledged that the Korean war had not really brought world war

closer nor increased the dangers in Europe, and then called in the international scene to justify the small number of operational formations and the lack of preparedness prevailing in March 1950. This chapter will endeavour to record the steps that were taken to bring about this additional strength and then to look forward at the problems and difficulties which the future may offer.

In normal times Parliament interests itself far more closely in the Army's manpower than in its equipment. The quieter the world political weather, the more ready Parliament is to be satisfied with a discussion of the numbers of men and their human problems; as the world sky clouds over, interest quickens in the number of operational formations rather than the hundreds of thousands of men; it is only since the storm clouds have gathered that equipment enquiries have been pressed home. In March 1950 the emphasis was on manpower, but particularly upon operational strength; in March 1951 it had shifted to equipment. Throughout the period manpower and equipment developments played an important part in the business of both Houses; they can for best convenience be treated separately.

MANPOWER

1. REGULAR RECRUITMENT

The memorandum accompanying the Army Estimates for 1950-51 submitted by Mr. Strachey in March 1950 showed the anxious concern of the Army Council towards the downward trend in regular recruitment, concern which was felt at a time when it was not intended to increase the total peace-time strength of the Active Army. The memorandum stated at paragraph 6:

During 1949, 18,400 volunteers were enlisted on normal engagements, of whom 2,300 were men already serving on non-Regular engagements. This figure is considerably lower than for 1948, which in turn was lower than that for 1949. In addition 3,400 men with previous service have been enlisted on short-service engagements. These figures reveal a serious situation, and unless the downward trend can be arrested the problem of maintaining an efficient Army will become increasingly difficult in 1951 and 1952. During 1949 the rate of Regular recruitment was sufficient to make good wastage and to increase slightly the Regular element of the Army, but the same level of recruiting in 1950 would not suffice to do this in view of increased wastage due to the large number of Regular and short-service engagements which will expire during the year.

In fact, Regular recruiting had dropped from 40,000 in 1947 to 34,000 in 1948, to 24,000 in 1949, and to an annual rate of approximately 23,000 in January to March 1950, nearly 20 per cent. below the average in the 1930s. There were 184,000 Regulars in the Army on April 1, 1950, just over half the total number of men serving. Mr. Strachey, later made some forecasts of Regular strength on the basis of existing recruiting figures: "On April 1, 1951, 178,000, with a probable further slow decline in the following two years." He asked for 30,000 recruits annually instead of 23,000, but he wisely put even greater emphasis on the need for more Regulars to re-engage after five or twelve years; he wanted 30 per cent. of the former instead of 10 per cent. to re-engage for

twelve years; and 20 per cent. of the latter to re-engage for twenty-two years instead of 15 per cent. It was significant that in July Mr. Shinwell admitted that on existing trends there would only be 150,000 Regulars by the end of 1951. These were all frightening figures, only slightly less frightening than the official attitude towards the one stumbling block—the comparatively low rates of Service pay, the continued existence of which made all the other improvements in service of little value. Mr. Strachey said that in the opinion of the War Office the pay factor was not on the whole as important as conditions of service. It was, of course, clearly of more importance to the Chancellor of the Exchequer, because it cost more.

Mr. Oliver Lyttelton, speaking after Mr. Strachey, used the Government's own statistics to prove that if it was right in 1945 to say that the new pay code was broadly comparable with civilian emoluments (which the Government had said) it must be right in 1950 to say that existing pay rates were no longer competitive, since average civilian earnings had risen since 1945 by 28s. 6d. per week, whereas the soldier has had a meagre 10s. 6d. increase; the differences grow wider when the rewards of skilled men or senior N.C.Os. were compared with what they might have earned in civilian life.

It was, nevertheless, not until August 30 that the Government decided to increase the rates of pay of the forces, at a cost for the three Services of £33 million a year on the basis of their existing strength, plus £13 million a year for the expected increase in numbers, plus a further £20 million for increased rates for the last six months of National Service.

This extra charge of £68 million a year was welcomed by the country and by Parliament, where for some time past the Opposition and back-benchers of all parties had advocated increases of the type finally adopted by the Government. The problem always was—whence the money? And that in politics is really a question of priority, the simplest and most recent example of which is the problem of free dentures and spectacles. Mr. Woodrow Wyatt, who has since become Under Secretary of State for War, suggested in March 1950 that a reduction in the pay of National Service would pay for a substantial increase in Regular pay. But more fundamental measures were needed, and it was an unkind fate that gave the Defence departments the Korean war to justify increases long overdue.

The new proposals gave an additional 31s. a week to other ranks up to the rank of corporal, and additional amounts ranging from 31s. 6d. to 42s. a week to senior N.C.Os. and W.Os. They also provided for bounties on re-enlistment and on re-engagement, a proposal specifically put forward by Mr. Oliver Lyttelton six months earlier.

The extra cost was immediately justified in the recruiting returns of the last quarter of 1950 and in the returns of re-engagements, but it is reported numbers in these returns have fallen—not unexpectedly—in 1951.

Officers were also given increased pay ranging from £82 to £146 per year, but by March 1951 the Secretary of State for War felt bound to emphasise his real anxiety about officer recruitment. He wrote in his memorandum: "I am still not satisfied with the Regular officer situation and with the comparative dearth of candidates of higher quality for Regular commissions."

In answer to a Parliamentary Question in February 1951 he disclosed that to maintain the existing establishment of Regular officers an intake of 714 new officers is required each year. But this figure is of course meaningless without regard to the wastage by premature retirement or resignation. Of more significance is the fact that only 482 commissioned officers passed out of Sandhurst in 1950, whereas 600 had been hoped for, and in the same year only 508 passed into Sandhurst. The Secretary of State, however, rightly laid his emphasis on the dearth of quality rather than of quantity. His hopes for improvement lie—as they lay a year ago in regard to other ranks—not in increases in emoluments but in better conditions.

Mr. Anthony Eden spoke in March 1951 of the absence of "security for a full career." This point had been partly met by the Government's decision to retain lieutenant-colonels and majors until the age of 55 in sedentary duties after they have completed their normal service in those ranks. It seems probable, however, that more has yet to be done before sufficient young men of the right quality will be persuaded to prefer the Army's reward for a good career to the many careers offered in civilian life, and before good married officers in their thirties will be persuaded to maintain their military careers when city firms, industry, or farming may offer them a life at once more remunerative and less disturbed. The remedy may lie not so much in rates of pay as in the size and treatment of allowances. The taxation of marriage and other allowances imposed since 1947 was unwise and unfair; but an attempt in the 1950 Finance Bill discussions to induce Sir Stafford Cripps to alter this decision met with the stone wall of orthodox Treasury arguments. Allowances for moving station in particular require re-examination. But probably the heaviest financial burden placed on the shoulders of the officer with a growing family is the cost of educating his children whilst he is serving overseas and of arranging for their holidays—at a time when the costs of private education and of travel are rising every month.

In a speech in March 1951 of an amazing balance of lucidity and wit, Brigadier A. H. Head reminded a packed House of Commons of the importance of the junior officer:

When Marlborough went to war the brigade was *en masse*; and the commander could almost shout so that everybody heard, but to-day troops are widely dispersed and there is far more delegated responsibility. It has increased in a way that could not be recognised by officers of previous times. One has to remember the importance of the company, platoon, and equivalent commanders. If they are not good we can pour money and men into the Army and it will all be in vain. We should have wasted our manpower, as well as our money, to say nothing of our industrial effort.

He reminded Members of five recent changes in the officer's position; the absence of the old attractions and amenities. "Many officers enjoyed riding, or falling off, horses. The horses have disappeared from the Army. It occasionally makes an ignoble appearance on men's plates at dinner to vary a monotonous diet." Cross posting from one regiment to another; the abandonment of the Cardwell system of balanced home and overseas service, which means that many serve an almost indefinite period abroad; officers no longer have private means.

He urged the War Office not to "pinch and scrape over getting good

chaps for the job." He cited as an example of inadequate pay the position of the married captain:

I believe the War Office worked out the minimum essential expenditure for the various grades. What the War Office works out as a minimum is not exactly a life of wine, women, and song. The sum—I think I am right—for a captain with a wife and one child and no Government quarter was about £800 p.a. He now receives £790 p.a., so if he lives as per the War Office he is a tenner a year overdrawn. But it is only fair to say that after four years he gets £820 p.a., which leaves £20 p.a. for wine, women, and song."

He added that he was not saying the officer is badly paid, but he reminded the House that a squadron leader, for example, in a tank regiment has under his charge half a million pounds' worth of equipment.

His other proposals included a uniform gratuity on retirement in addition to a pension, and an additional method of entry on Dartmouth lines alternative to Sandhurst. But he recognised that these measures would have no immediate effect and he asked the Secretary of State to reduce the size of staffs, and the constrictions of red tape, and thus to make suitable officers available for regimental duty.

These improvements in pay and conditions are none the less valuable because they seem to be overdue. But there are still signs that not only good officers but senior N.C.Os. and skilled men are far too few to maintain an Army of the 1951 size, still less to allow further expansion. The units of the 3rd Division and of the 6th Armoured Division now forming in England are reported to be woefully short of these men, and the Territorial Army can never be at instant readiness until more Regular officers and N.C.Os. are made available to it. Time may help, but in Mr. Oliver Lyttelton's words of March 1950: "If we are to solve this problem . . . we must first of all make the call of soldiering, the profession of arms, more highly respected than it has been in our country during the last year or two."

The stories of valour in Korea, and most recently the heroic action of the Gloucestershire Regiment, have brought the Army's name back into high public esteem. But many employers, trades unions, schoolmasters, and above all mothers and fathers have still to be persuaded that in 1951 the career in the Army is as noble and adventurous as ever it was, but also has an interest, a comradeship, and an opportunity of public service unsurpassed in history.

Perhaps different considerations may in part apply to the many technical posts that a modern Army offers. Here there is straight competition with civilian life, and particularly in the electrical and telecommunications trades there are too few trained men to satisfy the needs of industry and the forces.

This important matter was the subject of a report by the Select Committee on Estimates in 1950. This report was issued before the increases in pay were announced and, therefore, its comments upon the disparity in pay between industry and the forces have to be read in that light. But the suggestions for the development of a corps of technicians within the framework of the Territorial Association, drawn largely from those who have plied a trade whilst in the Service; and for the establishment of a voluntary part-time organisation for women—for those would be prepared to learn a skill—are still very relevant. It was also proposed that the whole question of reserved occupations should be settled without

delay since "it seems probable that the Service departments, in drawing up plans for mobilisation, may well be relying for immediate reinforcement upon men who are engaged as tradesmen in an industry which is vital to the country's war potential."

It has since appeared that though the Ministry of Labour is stubbornly reluctant to publish a list of reserved occupations, steps are being taken to ensure that the limited number of trained men are not counted twice in the reckoning of the nation's skilled manpower.

2. NATIONAL SERVICE AND EX-NATIONAL SERVICEMEN

In order to increase the numbers of men available to the standing Army, Royal Navy, and Royal Air Force, the whole-time period of National Service was increased in October 1950 from eighteen months to two years. Six months later 55,000 National Servicemen who would have left the Army remained with the Colours, some fighting and dying in Korea. This decision had political repercussions, social repercussions, industrial repercussions, and military repercussions, which Parliament debated in September 1950 when it reassembled for a two weeks' break of the normal summer recess.

There was no division on the National Service Bill which followed, but opportunity was taken to voice pacifist misgivings on the left, and on the right to ask why Mr. Shinwell, the Minister of Defence, should have said on July 26: "In present circumstances we are not satisfied that an increase in the period of whole-time National Service would solve our problem. But this is a matter we intend to keep under constant review." And a fortnight later the Government decided to make the increase.

The social repercussions were, of course, greatest on those who had planned a university course on the basis of the eighteen months' service. With one or two exceptions the Ministry of Labour and the universities managed to sort out all the difficulties by December, but the lack of early announcements of decisions ultimately taken proved that they were unprepared for the change.

That part of industry, particularly engineering, which is most affected by the rearmament programme is bound to feel the loss of trained men for two years more than it did for eighteen months. This has coincided with the loss of many skilled men whose National Service has been deferred since January 1949 until their apprenticeships have been completed. It is a fact, unpalatable to those who seek complete equality where equality cannot exist, that these men leave industry exactly at the moment when they become of real value in supervising the production of just those items of equipment which, when they join the Army, are found in shortest supply.

The military repercussions were chiefly felt in the T.A. which was deprived of the part-time services of their part of these 55,000 men for six months and whose strength in the possibly vital years 1951-53 would be accordingly reduced. Nothing was done to fill this gap until January 1951, when the Prime Minister announced the Z Class call-up scheme.

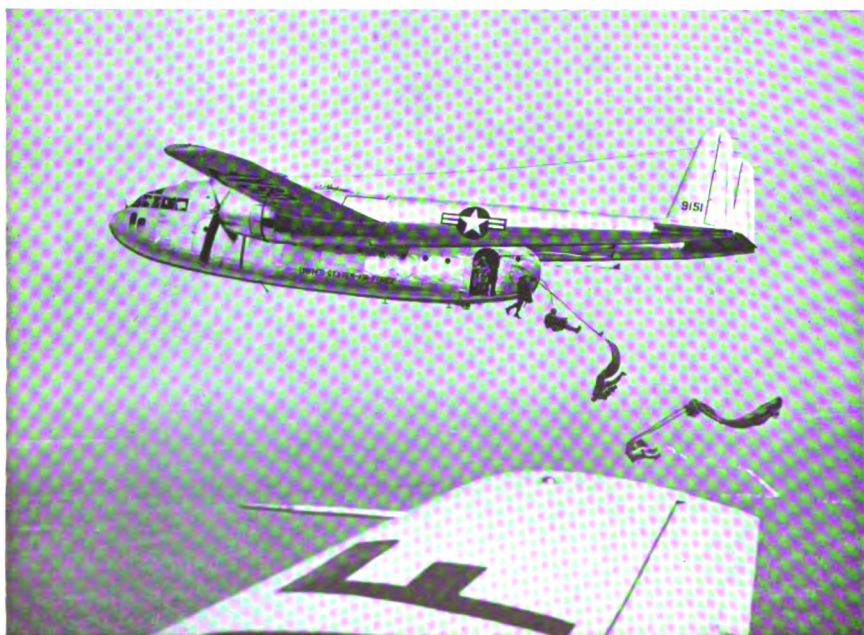
Class Z Reservists with liability to recall totalled 3,220,000 in July 1950, of whom 2½ million approximately had seen war service. Several members of Parliament had been advocating a full re-registration of these men



A British Centurion Tank in Korea—winter 1950–51



Boeing B.47 (the Atom Bomber). Take-off with rocket assistance



Fairchild C.119 Packet Cargo and Troop Transport Aircraft

since early 1949, and a strong demand for registration, classification, and allocation to units was made during Question hours in July 1950, when it was understood that addresses and occupations were being carefully checked by the War Office. The view was expressed by some that a special volunteer two years' T.A. engagement of reduced service liability should be offered to selected Class Z Reservists. In the event the Government chose a compulsory system of recall which is no doubt easier to handle. In announcing it on January 29, 1951, the Prime Minister said :

As the House knows, the Government's long-term plan has been to build up these Reserves through the system of National Service ; but there has not yet been time to build them up from National Servicemen who have finished their Colour service. The Government now propose to fill this gap by calling on a number of selected Reservists who have the up-to-date training required and giving them a period of refresher training so that if an emergency arose requiring general mobilisation, they would be ready to take their place in the units with which they have to serve.

Three weeks later Mr. Strachey told the House that refresher training was only the fourth of the purposes of the Z call-up, the first three being :

1. To bring into being the T.A. units and units to support the Active Army divisions.
2. To give these teams practice together.
3. To practise mobilisation.

There is no doubt that public opinion about the Class Z call-up was very confused in January and February. There can be no question that a large part of this confusion was due to the five weeks' delay that the Government allowed between the first "leak" to the Press that there would be such a call-up and the Prime Minister's statement on January 29.

Criticisms appeared in the Press that the fifteen days were too short. The *Sunday Graphic* cartoonist showed a soldier, on a charge with the R.S.M. reminding the C.O. of the difficulties of punishment during only fifteen days' service. A notice on the orderly room wall allocated the fifteen days to a minimum of training periods and a maximum of preliminary inspections. All this is being falsified in practice according to early reports of T.A. camps in May 1951.

It is easy enough to criticise the scheme as unfair because it is selective, or as inadequate because fifteen days is not long enough, or as a rushed makeshift, and so on. But the critic should first be clear of the object. Within the modest limits set by Mr. Strachey the fifteen days call-up will certainly have a value. Mr. Harold Macmillan stated the Conservative Party's attitude to the length of the call-up as follows : "Had the Government thought fit to propose a longer period, let us say a month, they would have our support."

But ought not the critic to criticise the object which the Government have accepted? This land frontier in Europe imposes upon us the duty of far more efficient mobilisation than we have ever had before. : 115,000 of the Class Z men are to go to "various technical, administrative, and fighting units which would be required in war to support our forces overseas and in this country"—namely, including the corps and Army troops for B.A.O.R. These units will have to be in Germany before D-day as it were. Since fifteen days does not allow the men to go to Germany this

year, their units are apparently not to see B.A.O.R. before mobilisation. And there are other men needed to convert B.A.O.R. into war establishment, Reservists earmarked for the fighting units there. They surely need both refresher training (for example on the new tanks) and introduction to their new team mates. This Z scheme does not cater for them.

Indeed, we should be clear what the Z scheme does not do. It does not in any way strengthen the divisions of the standing Army, it does not in any way find a permanent solution to the problem of strengthening the T.A. or the anti-aircraft defences of our country. It does not give the men in supporting arms and the administrative units destined to join the British Army of the Rhine in the event of an emergency any knowledge of the B.A.O.R. at all. The scheme does not affect more than one-third of the T.A. and only a part of Anti-Aircraft Command. Finally, it does not provide the degree of individual refresher training on modern equipment which all except very gifted Z men really need.

Perhaps no one has done more to stress the limitations of the scheme than Mr. Shinwell when he announced that no Z Reservist called up for training this year will be called up for similar training in further years. A week later Lord Alexander qualified this assurance by saying that "it will be specific intention not to call up the same individuals again if it can possibly be avoided." But it remains the Government's intention apparently to call up the 1st XI this year, and if there have to be further call-ups, the 2nd XI in 1952, the 3rd XI in 1953, and so on.

For the earlier excuse adopted by the Government and Mr. Shinwell's assurance that 120,000 additional National Servicemen will have joined the T.A. by mid-1952 had to be dropped when it was pointed out that these 120,000 will not fill the places of the 115,000 men going this year to the units of the Active Army.

3. REGULAR ARMY RESERVISTS

AND THE RETENTION OF TIME-EXPIRED REGULARS AND THE SUSPENSION OF OFFICERS' RETIREMENT

The release of all Regulars, officers, and men, was suspended on August 1, 1950, and a selective call-up of Regular Army Reservists, officers and men, was instituted. Subsequently these men were told that they would be retained with the Colours for between twelve and eighteen months after the date on which their engagement had expired or they had been recalled. Parliament passed the necessary legislation to safeguard the civil employment rights of recalled Reservists before the end of 1950, and the Government have recently brought forward a further Bill to protect tenancies and superannuation rights also affected by the call-up.

The existence of these Reservists was of the greatest value in manning the 29th Brigade which was sent from Great Britain to Korea in the autumn of 1950, but the importance which is still attached to retaining them is another sign of the dearth of Regular officers and N.C.Os.

4. THE BALANCE OF TOOTH AND TAIL

It has been said so many times that the post-war Army has too few teeth and too large a tail, that some believe it to be true and some untrue,

without in either case making sure of the facts. Indeed, it is exactly the facts that are most difficult to ascertain. The pundits discuss the balance of operational formations to the total strength of the Army in various ways, of which the divisional slice is the simplest and the most misleading. If it was true to say that there were six divisions, or their equivalent, in April 1950 the divisional slice was 60,000, it is true to say that there are ten divisions or their equivalent to-day and the slice is 45,000. These figures are, of course, quite meaningless.

Nevertheless, the average member of Parliament has been very concerned to find how small is the operational strength in an Army of 370,000 or 450,000 men even after allowing for anti-aircraft and the daily increasing complexity of modern equipment. Little criticism can be levelled at the numbers of men employed overseas in relation to the fighting strength produced, though it is sometimes forgotten that very large numbers of Germans are directly assisting B.A.O.R. in transport and workshop duties.

It is at home that the figures stagger the uninitiated. A rough calculation, using Vote A of the Army Estimates 1950-51 as a guide, shows that during the spring of 1950 approximately 200,000 officers and men were serving at home, and yet according to Mr. Churchill's unchallenged estimate there were not even a couple of well-formed Brigade Groups. The delay in sending the 29th Brigade to Korea was further proof that Mr. Churchill was right.

Many remedies to this alarming situation have been proposed. Mr. Strachey has recently announced further purges in higher headquarters. But headquarter staffs have to be as large as their responsibilities dictate; it may be that a review of these responsibilities would release more officers. Transport has been considerably reduced in divisions. But at the same time the number of wireless sets grows—possibly with many advantages to efficiency—and the number of bigger and better tanks will shortly grow too. More repairs and maintenance men have to be found, and more instructors and schools to teach them.

Others have therefore suggested that the British Infantry division itself may be too large. It is in manpower 50 per cent. larger than the Russian division, which nevertheless is reported to have greater fire power but less mobility. Its formation and unit H.Q. are certainly larger than they were in 1940 and much larger than their equivalents in the old German Army.

All these things are no doubt being considered. Parliament can only ask for constant pruning of the tail. Its knowledge of detail can never justify detailed proposals. It can, however, concern itself with the principles of Army organisation. An army organised to expand in two or three years will clearly have fewer standing operational formations than an army specifically organised for readiness in the immediate future. Our British Army was the former in 1948 and is now supposed to be the latter.

Parliament may also ask for a revision of overseas garrison policy which absorbs so many fighting units in policing roles. Colonial forces, it has been said, should be increased to give relief to the British Army. Dominions should be asked to take more of a share in our peace-time garrison commitments.

Manpower in Britain is so scarce, both in industry and in the forces, that all forms of waste must be avoided. The only adequate test is the amount of fire power per man in uniform ; or in more picturesque language the size of "bang" he helps to produce.

EQUIPMENT

From 1945 to 1950 the Army lived to a very large extent upon its wartime fat. Research on Army weapons and equipment proceeded under Ministry of Supply direction, but the Army enjoyed none of its fruits. No new gun or infantry weapon was produced. The Centurion tank was the one solid improvement in Army equipment, but its rate of production was low until the first autumn of the Korean war. Much money was, however, spent during these years in repairing old vehicles, in maintaining and repairing radar equipment, and in guns of all kinds.

On July 26, 1950, Mr. Shinwell told the House of Commons that there were adequate stocks of small arms, mortars and artillery, with ammunition, but that steps were being taken to improve the position as regards anti-aircraft guns and predictors, anti-tank weapons, and specialised vehicles. The Centurion tank was, he reported, in full production, and there were 6,000 tanks of the last war types in service.

Of the major items of Army equipment the serious deficiencies seem now to be up-to-date predictors for anti-aircraft guns, in new anti-tank weapons, in new vehicles, and in the numbers of Centurions. The evidence given to the Select Committee on Estimates in 1951 disclosed that the No. 1 predictor would still be in service in some units until the end of the year. There has been no report of any new large anti-tank gun other than the new gun on the Centurion tank, but the new large bazooka is reported to be in production.

The long-awaited decision to order new vehicles of the standardised pattern developed since 1945 was taken in 1950. The British jeep will probably be the first to make an appearance in quantity. It was, however, disquieting to learn that a delay was likely in the production of the larger vehicles because the development of the chassis had not kept pace with that of the engine. The post-war policy of the Army to use rebuilt vehicles of 1945 pattern was justifiable on economic grounds only if adequate arrangements existed to produce new types at short notice in large numbers.

The Parliamentary searchlight has been seeking out the country's tank position. Mr. Shinwell reported in July 1950 that the Russians had 25,000 tanks, and Mr. Churchill asked a day later if it would be excessive to estimate that there were 4,000 to 5,000 tanks in Russian-organised formations on or near the Western Front. The Centurion has already won an excellent reputation in Korea and is esteemed by our allies in Western Europe. Its gun is believed to have enviable accuracy and penetrating power. But it is an expensive tank, costing more than twice as much as its wartime sisters and using a corresponding amount of scarce metal and skilled manpower. Until the end of 1950 the authorities appear to have been satisfied with the two factories, including one Royal Ordnance factory, then producing the hull, and with this one factory producing the engine. It was not until six months after the Korean war

began that a decision was reached in the War Office to order more tanks, of the Centurion type or better, than these two factories could produce. Two more factories are now to be allotted for this purpose, but neither will be in production till 1953. This delay is due in the main to the absence of the necessary machinery and machine tools for the production of the hull and turret, delivery dates for which are many months ahead. The expansion in tank production since 1950, claimed by Ministers as doubling the 1949 rate of production, used up the maximum capacity of the two original factories.

It may seem extraordinarily unwise for the defence departments to have made no preparations to expand the production of tanks in an emergency. None apparently foresaw the need for a sudden increase in numbers. Certainly none was prepared to spend the small amount of money available for Army weapons in those years on reserve machinery and tools, and maybe forgings too. But looking back, it is easy now to point out that if tanks are essential to a modern army, the creation of a large trained reserve of manpower was quite wasteful unless sufficient tanks could be made available. In other words, the degree of readiness of the Army depends as much upon the availability of numbers of good tanks as upon numbers of trained men.

That is not to deny the Comet and the Cromwell, which must form the majority of the 6,000 tanks in service. One may, however, ask how many of these are battleworthy? Are spares in existence for them? Clearly these questions must be given a satisfactory answer during the next few months whilst Centurions are still too few. There is a case, indeed, for making full use of the Comets and Cromwells in any event as a cheaper infantry destroyer than the heavier Centurion.

Newspaper discussion has centred for a time on the old controversy—light tank *versus* heavy tank. There is, however—and happily so—little sign that the War Office are considering abandoning the present tank policy in favour of a larger number of light tanks and a few large “heavies.” The advocates of the light tank never—so it seems to me—explain what happens when having successfully outflanked or penetrated into the enemy position they force the enemy tanks to give battle—and the enemy tank happens not to be such a light tank.

The production of a tank like the Centurion imposes a heavy strain upon industry which many might like to avoid, and it is a credit to all concerned that they have resisted the specious arguments against it. It is the opinion of many, however, that the full requirements for tanks has not yet been stated. There are to be three armoured divisions in Germany, but no mention is made of an independent armoured brigade for the 2nd Infantry Division nor for the 3rd Infantry Division in England. If the strength of British armies against Russians lies in the fire power, mobility, and quality of their divisions, it would seem that tanks should be available on the basis of one brigade for each division in Europe or the Middle East. Starting with the six divisions in Europe or England and one in the Middle East, the requirement is for 2,400 tanks at least and an additional 600 self-propelled anti-tank guns or tanks in a tank destroyer role. Production plans must, moreover, cater for a future expansion and further reserves, and must certainly be designed to equip the T.A. armoured divisions and armoured brigades. The full extent of the

problem, certainly of its solution, must be hidden from all who have no access to secret information.

The paucity of information about equipment which is made available to Parliament is well illustrated by the following extracts from Mr. Shinwell's speech in February 1951:

The output of weapons and equipment for the Army in 1951-52 should be almost double what it has been in 1950-51 . . .

and referring to anti-aircraft:

Of the heaviest type of gun a proportion have had their efficiency greatly increased by conversion to full automatic control, and programmes are in hand to convert the remainder. . . .

The rate of production of the latest type of radar has been considerably stepped up and the stocks increased by 45 per cent.

and to tanks:

We are setting up two new tank factories. . . . That will be an emphasis on tanks and on new types of combat vehicles.

The output of this type (Centurion tank) will be greatly increased so that re-equipment of our armoured divisions can be rapidly completed.

No one can say that Parliament is controlling the Minister of Defence if no more than that is known about his equipment plans for the Army.

In a most valuable debate in the House of Lords on February 21 and 22, the detailed reading of which is most worthwhile, this security problem was discussed by men of the widest experience. Lord Swinton, who opened the debate with a speech which was at once wide-ranging and emphatic on every point that can matter, pointed to the contrast of what is done in the United States of America. They have publicised, for example, their intention of producing 35,000 tanks in 1951. Lord Swinton summed up Parliament's difficulty as follows:

It is the right and duty of Parliament to know what is being done and what progress is being made. If it is still said that this information, without which Parliament cannot discharge its elementary duty, cannot be given to us in public, then there is an overwhelming case for a full statement of our present position and prospects to be made to us in Secret Session and for regular progress reports to be made to Parliament in the same way. We all want to help in re-armament; and we have some practical experience. But how can we help if we are kept in complete ignorance.

Others put forward the argument that in many matters the advantage of telling your own countrymen the full facts will outweigh any disadvantage of telling the enemy of things which he may know in any case through his intelligence activities. Lord Ismay warned their Lordships of the danger of telling "the other man." He thought the public could be given more information than at present, "to make clear not only the dangers, but the necessity for sacrifice and effort." To enable Parliament to discharge its responsibilities, he suggested that the only answer is to have a Secret Session.

In 1949 Lord Portal, former Chief of the Air Staff, had said: "But on the whole I think that secrecy will lose us much more than it will gain us, particularly in what I may call general confidence and morale."

For the Government Lord Alexander, replying to the debate, pleaded

that Moscow gave us less information than Hitler and seemed to argue that Moscow's intelligence system was better than Hitler's; he added the well-known argument that since we are working in the Atlantic Defence organisation we can only publish as much as all wish to publish. He gave no comfort in his remarks about Secret Sessions which the Prime Minister has always refused. The difficult security problem remains as unsolved as ever.

More information is disclosed in confidence to the Select Committee on Estimates; but in the absence of any provision applying the Official Secrets Act to M.P.s there has to be a limit set. However, the 1951 Report of Rearmament—an interim report published in May—gives some useful information on the progress and difficulties of the Government plans. It is impossible to avoid a feeling that rearmament took too long to start, and that the early decision to permit orders within £100 million limit for all services, then within £200 million limit, then within a three-year programme of £3,600 million, and finally within the three-year programme of £4,700 million, resulted in some hiccoughing in higher planning.

But whatever information is made available criticism, constructive as well as destructive, on equipment and other matters is likely to be wide of the mark unless a correct assumption has first been made of the size and type of Army to be maintained in the next few years and the expansion intended on mobilisation.

THE ARMY'S SIZE AND ROLE

The international scene is dominated by the threat that the world will be enslaved by Russian Communism—the aim of the Kremlin overlords. The threat is twofold: a threat to freedom and a threat to peace. In its face the Western powers have joined together to preserve freedom and peace by building up their joint strength. It is intended to overcome the threat not by military conquests but by making it clear that any military aggression by Russia will be met at once by superior force; if there is to be a war, it is to be a short war which Russia will lose. It is the essence of this policy that the Kremlin overlords are assumed to calculate the chances of each move they undertake carefully without prejudice and without Hitlerian temperamental unpredictability.

Such a policy dictates that Western Europe must be held and not surrendered in the initial stages to the French maxim—*reculer pour mieux sauter*. It is an inescapable political fact that no country is likely to join in a defence plan the basis of which does not safeguard its homes from Russian Armies if the Russians attacked.

Western Europe is the one part of the world in which the failure to defeat the Russians means the defeat of the West. Defeat elsewhere must be avoided if possible, but does not sound the death knell of freedom. It is in any event impossible to hold firm everywhere. The land strategy has to be based on a few firm bases in vital areas and as large, and as mobile, a Reserve as resources will allow.

It is not for Britain alone to decide the commitments to be allotted to the British Army. In the nature of things, however, those commitments have to conform to a familiar pattern. Colonial responsibilities force us to maintain law and order in Hong Kong and Malaya and to protect their

peoples from exterior aggression. Treaty responsibilities as well as traditional policies compel us to keep as large a reserve in the Suez Canal Zone or Middle East as we can. Other overseas garrisons and occupational duties in Trieste and Austria will absorb valuable fighting units so long as these responsibilities continue. The rest is for European and Home defence, which are inextricably mixed up together. It is a happy incident of history that the first occasion in peace-time on which we have accepted a land force commitment in Europe happens to be in an air age when the military frontiers of Britain really ought to be—for its own self-protection—upon the River Rhine if not upon the Elbe.

The main task of the British Army must, therefore, be to prepare with its allies to win the land battle in Europe in its early rounds. This task becomes no easier if the time factors are assumed as follows: the earlier we are strong, the more likely we are to succeed in maintaining peace and freedom: the more we succeed, the longer we shall have to be strong in half-peace, half-war conditions. A sprint to build up strength: a marathon endurance test to maintain that strength.

In the light of these considerations the slow progress of collective defence since the Brussels Pact was signed in 1948, and the North Atlantic Treaty in 1949, must be disquieting. Each of these treaties constituted a real stride forward along the road to greater Western strength, where political barriers abound to bar the way of the practical soldiers. A further stride forward was taken at the end of 1950 when General Eisenhower was unanimously appointed Supreme Commander of the North Atlantic land forces.

Other decisions had been taken before the end of 1950 which promised a substantial addition during 1951 to the number of divisions in Western Europe. The British Army of the Rhine is to have three armoured divisions and one infantry division in the British Zone by the autumn. The United States Army in its zone is to be increased to six divisions during the year. The French are committed to have in being for European Defence ten divisions by the end of the year. But the total of all this does not amount to the thirty divisions which has been given by some as the minimum force which can be a deterrent. It will be a very considerable achievement if that number of fully equipped divisions really is stationed in or near Western Germany before the start of 1952.

One further decision, that to allow a measure of German rearmament, which was taken in the latter half of 1950, might, if it had been followed by action within six months, have prepared for an even more important addition to the strength of land forces in Europe by the end of 1952. Unfortunately, the Germans, who seem to have been forgotten, are the most important party to their own rearmament and show few signs of taking the necessary political steps to start a new German army. Many reasons, and even more excuses, are advanced to explain this obvious reluctance to face the facts of post-war Europe. The Western Allies can, however, help to remove two of the most important of the reasons: namely, the German fear that to rearm themselves before the Allies have formed an eastern wall for their country does not deter but invites aggression; and the second fear that the present scale of divisions in Germany is evidence that the Allied strategy does include *reculer pour mieux sauter* in Europe. If by the end of the year 1951 the British Army does

have four divisions, still more if it has five or six, in Germany, if the United States army has six, and if the number of British and United States fighter squadrons in Germany has really been substantially increased, the Germans will then have no further valid reason for their fears.

The importance of Germany's whole-hearted co-operation with General Eisenhower's forces is not only political, nor a matter of numbers of divisions. There is a military aspect of this problem that is often forgotten: the many thousands of Germans employed on transport and workshop duties by the Allied Armies and Air Forces of occupation are essential to the continued existence of these forces in peace-time and for the early weeks of war. If Germany has no army of her own at the outbreak of war, however fantastic it might seem, their leaders might invoke neutrality, and in invoking it withdraw all direct support to Western forces. History shows how the German, more than any other European, answers to the call of his Government at times of national crisis.

Too many nations seem to be assuming that if Russia attacks Europe it will attack frontally. The Far East is proverbially Lenin's back door into Europe. But is not the Middle East and Eastern Mediterranean an adequate side door into Europe and into Africa. Turkey and Greece certainly fear so. Whether or not the Russians appreciate the problem that way, it is a fact that Turkey, Greece, and the Middle Eastern Islamic countries also present the West with a most valuable side door into Russia, particularly for air attack. It is not unreasonable for these countries to look around, as Germany has done, at the relative strength of the land forces of Russia and the number of Western Divisions available for action near the Russian southern frontiers. The United States Navy is in considerable strength in the Mediterranean, but there is no sign that for political or military reasons any United States division is likely to go out to the Eastern Mediterranean or Middle Eastern area. France is too busy in Indo-China even if it were politically possible to allocate French forces to this area. Britain remains. Only a very stretched imagination could be satisfied with one fully equipped division as the mobile reserve for this area. The pessimists see little to be gained by making this two divisions—if that were possible. Recent events in Anglo-Egyptian relations seem to threaten even the present modest contribution.

Against that background, how large a British Army in operation strength has it been decided to keep in being during the next few years? This is not the place to crystal gaze, but the evidence on which the ordinary member of Parliament can answer that question is very scanty. Yet, without an accurate answer it is quite impossible to justify the adequacy of the money and men voted annually to this Army, and of the plans and arrangements reported from time to time by the Secretary of State.

If Regular recruiting continues at a reasonable rate and if the National Service call-up produces in future more than 120,000 men in the year, the manpower available to this Army during the next few years should be between 450,000 and 480,000. As the Territorial Army expands, and the remaining eight of the promised twelve divisions are given the men which the chosen four divisions are being given this year, more Regulars will be required there; but as the Reserve system becomes more organised and mobilisation plans better cut, it may be possible to rely more upon the immediate availability of picked men to bring Active Army divisions

up to full strength. This might, if it was practicable, enable more divisions to be formed. But if the reasons given at present for the small number of divisions at home in relation to the large number of men are accepted, it seems unlikely that more than another two divisions can be formed unless very radical decisions are taken. It is said that we have the equivalent of ten divisions to-day, presumably:

$2\frac{1}{3}$ at home
 $3\frac{1}{3}$ in Germany
 $\frac{2}{3}$ in Austria and Trieste
 $1\frac{2}{3}$ in Middle East
 2 in Malay, Korea, and Hong Kong.

These fractions of divisions are very misleading, as the case of the 27th Brigade proves: it is reported that it was able to take to Korea neither supporting guns nor tanks nor engineers which had to be supplied by the United States of America. This is not a criticism of the decision to send it, but it is a just criticism of the fractional system of division counting.

It would not be exaggerating to say that the Western foreign policy, to which we are wisely fully convinced adherents, requires the following minimum contribution in divisions in 1952:

$5\frac{1}{3}$ or $6\frac{1}{3}$ in Germany
 $2\frac{1}{3}$ or $1\frac{1}{3}$ at home
 2 in Middle East (plus garrisons as at present).
 2 in Malaya, Korea, and Hong Kong
 1 total garrisons and occupational forces reckoned on fractional basis.

12 $\frac{2}{3}$

The political advantages of such forces would seem to outweigh the military, social, and economic difficulties of achieving them: but it is, of course, the worst possible policy to organise manpower into divisions for which there is inadequate equipment. The maximum number of divisions which Great Britain can sustain in war with equipment, munitions, and men must be a closely guarded secret. Presumably it is not less than the ten so-called divisions of the Active Army, and the twelve projected Territorial Army divisions, but it may not be very much more.

Much may depend, of course, upon the ultimate fate of the anti-aircraft gun. The absorptive capacity of Anti-Aircraft Command in men and new equipment was rightly made the subject of an emphatic warning to the House of Commons by the Secretary of State in March 1951. No one can grudge the cost of the very special equipment without which the modern fast-moving bomber would never be engaged. But the better the equipment becomes, the more machine-like the task of handling it and the less need there may be to employ large numbers of whole-time serving soldiers. It is to be hoped that the new Home Guard, arrangements for which are reported to be nearly settled, will be able to take over part of the static anti-aircraft defence of Great Britain.

It seems to have been decided to leave the settlement of the future of the Home Guard until last. As a result, it may be found later that alterations are needed in the Civil Defence and Home Forces defence

plans. The appointment of General Sir Miles Dempsey as Commander-in-Chief designate of the home defence land forces is to be welcomed for many reasons, not the least of which is that one authority may now review the whole problem of home defence. Neither the Home Guard nor Civil Defence is likely to be fully manned even on paper up to its pre-mobilisation establishment until decisions have been made public on who will, and who will not, be required for service with the Army, Royal Navy, and R.A.F. on mobilisation. The maximum age at which "Z" men will be released, and the provisional list of reserved occupations, which have been the subject of many Parliamentary Questions, are two of the most important decisions involved in this connection.

It is easy to point to some of the problems of the future: it is not only difficult but well-nigh impossible for those to whom secret information is not divulged to point to their solution. The present writer constantly recalls the advice given him by a famous Supreme Commander that he and his friends of all parties who fought in the last war must never relax their efforts to ensure that enough of the best equipment is available to the Army on mobilisation. The National Service Act 1947 set out to provide for a large trained Reserve. The part of the £4,700 million three-year rearmament programme of 1951 allotted to the Army sets out to produce more equipment for the Active Army and Reserve Army. The Secretary of State has recently shown how steps are being taken to increase the Regular element of the Army. Parliament seeks to ensure that a proper balance is struck. It is the writer's view that equipment is the greatest need to-day.

But for all the things that have been left undone, much more has been done to strengthen the Army in the thirteen months under review, because of the impact of international events, than ever before in peacetime. A visit to B.A.O.R., even more than a study of reports, confirms Mr. Strachey's feeling that "a sense of accomplishment is beginning to grow." The country reaps an immeasurable harvest because Opposition and Government share the broad aims of a foreign and defence policy. The Opposition's main anxiety is not to prevent the Government building up a strong Army, but to help in this task by constructive criticism which includes frank condemnation of errors. The full implementation of re-equipment plans, the maintenance of a standing Army upon a long frontier in Europe, the preparation of a large Reserve, and the expenditure of large sums of taxpayers' money which all these involve will call for wise and firm handling by Ministers—whoever they may be—in the next five years.

A. R. W. Low

CHAPTER XIX

THE IMPERIAL ARMY

TASKS AND DEPLOYMENT

GENERAL

SINCE THE last number of "Brassey's Annual" appeared it may be said that a change of policy, which has been taking place gradually since 1947, has reached fruition. In a sentence, the Imperial Army is no longer an overseas police force, which in 1945 we hoped would be its future role, but part of an Allied force with the main task of defending Western Europe. The reasons for this change are clear to all, and it has come about in spite of war in Korea and the intensification of "cold" warfare in other parts of Asia. Our Government, and their military advisers, have not been hoodwinked into believing that pressure in the Far East is anything more than a diversion designed to attract attention from the vital spot—which is Europe. With the full co-operation of the United States and free peoples of Europe, we are now committed to an all-out effort to place European defence on a sure and firm footing, and provide our quota of the fifty-odd divisions which are estimated to be General Eisenhower's minimum requirement.

In another chapter suggestions for better Commonwealth co-operation in defence have been made; but any action on the lines proposed is a long-term policy. This chapter deals with the situation as it is *to-day* in relation to the Imperial Army.

In adopting this change in the trend of policy we have not been able, as we would have wished, to make any reduction in our overseas garrisons. Indeed, the requirements of the Korean war have forced us to send more troops to the Far East, although the burden in this direction has been eased by the older Dominions (Australia, Canada, and New Zealand), who have despatched fine Army contingents to Korea. Our efforts to increase and improve the British army in Europe have taken the following form:

- (a) An increase in the length of National Service from eighteen months to two years.
- (b) By a considerable increase in the rates of pay, and by more attractive conditions, recruitment for the Regular Army has been improved.
- (c) By various economies in the use of Army manpower, coupled with increases in strength due to (a) and (b), it has been possible to provide, or plan to provide, additional Infantry and Armoured divisions.
- (d) By utilising the "time-expired" National Servicemen to increase the strength of the Territorial Army and reduce the time lag between the outbreak of hostilities and the date when Territorial Army formations become operationally efficient.

- (e) By a more austere domestic economy certain industrial capacity has been turned over to war production to equip new formations and bring others up to date.

COMPOSITION AND ORGANISATION

The general composition and organisation of the Imperial Army has not changed within the past year, although a few minor modifications have been made. (In general the remarks made on this subject in Chapter XVI, pages 145–51, of “Brassey’s Annual,” 1950, still hold good.) It is in the tasks and deployment of our land forces that changes have occurred, and these warrant explanation in some detail.

TASKS

Summarised, the tasks of the Imperial Army, in conjunction with those of other Commonwealth countries, our Allies and friends, and the other Services, are as follows:

- (a) The defence of Western Europe. This very wide term includes the defence (including the A.A. defence) of Great Britain and Northern Ireland, occupational duties in Germany, Austria, and Trieste, and preparations for participation in an active campaign on the Continent in the event of aggression. (It is not inconceivable that under certain conditions the area might be extended to include Eire—in conjunction with the Eire defence forces.)
- (b) The defence of areas vital to our sea and air communications and the protection of supplies of oil and other raw materials—Malta, the Middle East, etc.
- (c) The defence of our interests in the Far East—Malaya and Hong Kong—and co-operation with other members of the United Nations in the Korean campaign.
- (d) Provision for rapid expansion in the event of a major war—based on the Territorial Army.
- (e) The co-ordination, by the General Staff, of the land forces throughout the Commonwealth and Empire and advice and assistance to our Allies and friends.

COMPOSITION, SIZE, AND DEPLOYMENT

Obviously these are matters which have a security aspect, and exact figures and locations cannot be given. It is only possible to deal with the matter in general terms and confine any remarks to consolidating information given piecemeal in Parliament and in the Press.

THE ACTIVE ARMY

The term “Active Army” is used to denote Regular and National Service personnel serving at home and abroad on a full-time basis. From figures published, it would seem that, in round numbers, the Active Army is distributed approximately as follows:

United Kingdom	..	..	..	225,000	
Germany	..	..	..	100,000	
Austria	}	..	..	10,000	
Trieste		..	..
<i>Total in Europe</i>				—	335,000
Middle East	..	..	..	55,000	
Malaya (including Gurkhas, who rank as Imperial troops)	..	..	..	20,000	
Hong Kong	..	..	..	12,000	
Korea	..	..	..	15,000	
<i>Total outside Europe</i>				—	100,000
					<u>100,000</u>
<i>Grand Total</i>					<u>435,000</u>

On the assumption that the strength of a division, plus the administrative troops to support it, requires some 25,000 officers and men, it would appear that we should be able to maintain about thirteen divisions in Europe and about four elsewhere—a total of sixteen divisions. This might be so in the case of an army organised on the Continental pattern, but it is an entirely wrong calculation in the case of an overseas Empire and our own peculiar circumstances. Unfortunately, we are unable to provide anything like sixteen Active divisions. The reasons for this are as follows:

- (a) With a period of two years' National Service only about 60 per cent. of the National Servicemen are available at any one time for service in field formations and units. The remainder are either undergoing primary training at depots or travelling to or from some distant station or theatre of operations.
- (b) A very large number of long-service Regular officers and men (particularly N.C.Os.) are extra-regimentally employed—in staff or administrative appointments, staffing instructional establishments, providing the permanent staff of Territorial Army units, etc.
- (c) Our commitments, dispersed as they are all over the world, make it necessary to have a number of isolated units (such as an Infantry battalion in Jamaica) which cannot be fitted into any field formation.

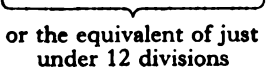
It should be noted that as most of the big Army instructional establishments are located in Great Britain, this, together with the fact that the Territorial Army absorbs a very large number of Regulars, makes the proportion of extra-regimentally employed much higher in Europe than elsewhere. As will be seen later, this is reflected in the comparatively small number of Active divisions which can be provided from over 300,000 Army personnel in Europe compared with the number provided from 100,000 outside Europe.

Although a dispersed army, with isolated units, may provide a useful police force in times of real peace, and offer good facilities for leisurely technical training, it cannot be over-emphasised that *in war the measure of an army's strength and efficiency is the number of Active formations which it can put into the field.* In the British Army the standard field formations

are the Infantry and the Armoured division. As it is not unreasonable to suppose that the first few weeks of the next war may be decisive—and as divisions cannot be improvised at short notice—it follows that the war potential of the British Army depends, to a very large extent, on the number of Active Infantry and Armoured divisions maintained in peace.

From the information which the authorities are able to disclose it would appear that the number of Active field formations to be maintained in the British Army—when recently authorised increases have been made—is likely to be as follows:

				<i>Divisions</i>	<i>Independent Brigades</i>
United Kingdom	..	..		2	1
Germany..	..	..		4	1
Austria }	..	..		—	2
Trieste }	..	..		—	—
Middle East	..	..		1	—
Malaya ..	..	..		—	5*
Hong Kong	..	..		1	—
Korea ..	..	..		—	2
Total	..	..		8 divisions	11 independent brigades



 or the equivalent of just
under 12 divisions

* Includes Imperial Gurkha units.

These figures are no more than approximately accurate, and are subject to constant changes. Assuming that they are roughly correct, it will be seen that we shall have:

In Europe The equivalent of just over seven divisions.
 Outside Europe .. The equivalent of just over four divisions.

It should be noted that the word “equivalent” is used. As will be seen, there are a number of brigades which do not form part of a division. This is a source of weakness. Three independent brigades are not of the same fighting value as one properly organised and trained division—apart from the fact that independent brigades are usually widely dispersed, and in the event of war it may be some weeks, possibly months, before they take the field.

THE RESERVE ARMY

What may be termed the Reserve (or part-time) Army quartered in the United Kingdom consists of:

- (a) The Territorial Army.
- (b) The Supplementary Reserve.

The fundamental difference between the two is that the Territorial Army is localised and the Supplementary Reserve is not. Units of the former are based on their T.A. centre or “drill hall.” The latter can draw its men from any part of the country and is, therefore, best adapted to meet the needs of technical units.

As we know, Territorial Army formations existed before both world wars and performed magnificent service: in the closing years of hostilities they were the equals of Regular units in fighting capacity and technical efficiency. In World War I it was many months before Territorial units took the field in any numbers. This was a drawback, but not a vital factor to our disadvantage in the conditions of 1914. In World War II the period before battleworthiness was attained was considerably reduced—mainly owing to greater awareness of the approach of hostilities, which resulted in accelerated training, and other arrangements, before the declaration of war. Nevertheless, even those divisions which were given priority in equipment took some months to attain a standard sufficiently high for mobile active operations.

Clearly any considerable lapse of time between the opening of a major war and the date when the greater part of our Reserve Army can take the field is a danger, and unacceptable under present-day conditions. We require a Reserve Army whose formations and units will be ready in a very short time—at the most a few weeks.

This requirement has been catered for by posting National Servicemen to Territorial and Supplementary Reserve units on completion of their two years' full-time service. This system has not yet had any marked effect on the strength or efficiency of the Territorial Army and Supplementary Reserve, as up to now only a very small number of National Servicemen have been drafted to units. As time goes on, however, these men, together with Territorial Army and Supplementary Reserve volunteers, should provide sufficient numbers to ensure that units mobilise at war establishment. The ratio of National Servicemen so drafted is approximately 75 per cent. to Territorial Army units and 25 per cent. to the Supplementary Reserve. This Reserve period is for three and a half years.

It will be seen, therefore, that National Service fulfils two functions:

- (a) It provides whole-time officers and men for the Regular Army.
- (b) It provides a reserve of well-trained men for the Reserve Army.

It would, however, be a complete fallacy to suppose that efficient Reserve Army units—ready to take their place in the field at an early stage of hostilities—can be provided from "time-expired" National Servicemen alone. Territorial Army units will, therefore, in addition contain two classes of volunteers:

- (a) Officers and men who have returned to the T.A. since the end of the war. With their experience their main function is to train and lead the National Servicemen, and to infuse into them the volunteer spirit.
- (b) National Servicemen who volunteer for the T.A.—i.e. become T.A. soldiers instead of ex-National Servicemen acting as T.A. Reservists. The success of the scheme and the future efficiency of the T.A. depend, to a very great extent, on obtaining a large number of volunteers in this category.

At first sight it might appear that volunteers in category (a) above, who are perhaps not completely up to date in modern military technique, are

not the ideal leaders and trainers for men who have just completed two years full-time service with the Regular Army—including in some cases active service in Korea or Malaya. In practice, however, it is found that any deficiencies of this kind are more than counteracted by the prestige provided by their 1939–45 war service and the fact that they are much older and generally more experienced men, with a very keen volunteer spirit. Moreover, their numbers will gradually dwindle to extinction and their places will be taken by category (b) volunteers, many of whom it is hoped will become enthusiastic Territorials of the type which kept units alive during the lean years between the wars.

Information connected with the detailed composition of the Territorial Army—including recent increases—has, of course, a special security aspect. In general terms the organisation is as follows:

- (a) *The Anti-Aircraft* defence of the United Kingdom is entrusted almost entirely to Territorial Army units. H.Q. Anti-Aircraft Command (Stanmore) is responsible for training A.A. formations and units. They are administered partly by H.Q. A.A. Command and partly by the geographical Commands (i.e. Northern, Southern, Scottish, etc.) in which they are located. It should be noted that *operationally* A.A. Command is under the control of the Air Officer Commander-in-Chief, Royal Air Force Fighter Command.
- (b) *Territorial Army Infantry and Armoured Divisions*, of which there is a total of ten.
- (c) *Territorial Independent Brigades* (of which there are five) and independent units.

Summarised, it may be said that the Reserve Army provides—or will provide when the influx of National Servicemen brings units up to strength—the A.A. defence of the United Kingdom, home defence in the initial stages of war, field formations to support the Regular Army at a comparatively early date after hostilities commence, and the means of further expansion if necessary.

THE HOME GUARD

Mr. Shinwell, the Minister of Defence, announced in the House of Commons on November 15, 1950, that the nucleus organisation for a revived Home Guard was to be set up at once. This is, however, only being done on a very modest scale—confined to arrangements for the preparation of plans in each Command at home for the formation of the force should the necessity arise. Enrolment—even on a cadre basis—is not as yet visualised. At first sight these very meagre arrangements appear to be totally inadequate, as no one can doubt the value of an efficient locally raised force of this kind as a counter to invasion, either by sea or air. Apparently the reasons for the recent decision are (a) that enrolment for the Home Guard would have an adverse effect on recruiting for Civil Defence; (b) that for the first few weeks of hostilities the Territorial Army provides a home defence force and by the time it is ready to proceed overseas the Home Guard could be formed, and to some extent trained, to take its place; (c) That expansion in other directions leaves insufficient

instructors to train the Home Guard properly—a condition which is, of course, only temporary.

In conclusion, it may be said that in the past year we have done much to improve conditions in the Regular Army for both officers and men, and to put our Regular Forces and Reserve Army on an improved footing in keeping with the dangerous condition of the times.

It is perhaps permissible to end this chapter with a word of warning. Since 1945 the British Army—and the other Services too—has relied on the large numbers of men trained to arms during the war to meet requirements in an emergency. These men—the Army Z Class Reservists, a small proportion of whom have been called up for refresher training this summer—have now been back in civil life for several years. Many have lost, and others are rapidly losing, their military skill; some have become unfit; a few have died; many are in occupations essential to war production and therefore not available for the Forces; a small proportion have emigrated. Only a few are still available as potential fighting men, even after some weeks of intensive training. The time has gone when we can rely on those who fought the last war to fight the next one. To some extent the recent measures to increase Army manpower (the extension of National Service to two years and improved conditions for the Regular Army) are, therefore, in substitution for the loss of trained Reserves from the men of 1939–45—not an addition to actual or potential strength. Some of the men who fought with the field armies might do so again; but a high proportion would be relegated, of necessity, to part-time service in a revived Home Guard.

C. N. BARCLAY

CHAPTER XX

KOREA: SOME TACTICAL LESSONS

1. GENERAL

AS I WRITE, the Communist deputation to the Cease Fire conference is travelling southward from Pyongyang to Kaesong. The Chinese Communists admit thereby that they have proved unequal to their self-appointed task of driving the United Nations forces out of Korea. Now they must seek other means to undermine the United Nations' resolution.

It would be foolish to suppose that either the Russians or the Chinese have undergone a change of heart. The Communists—opportunists always—will change their methods readily enough, but never their aims for the undoing of the free world.

At the tactics that the Communists are likely to adopt at Kaesong it is not difficult to hazard a guess. To a Cease Fire they may agree readily enough, but not so to armistice terms. When it comes to negotiations of this sort the Communists have this great advantage—they have no public opinion to consider; in all circumstances they can count on the dumb resignation of their Army and their people. Thus they need not hesitate to protract the armistice negotiations indefinitely in the hope that pressure "to get the boys home" will build up meanwhile in the United Nations and particularly in the United States. As time passes, public opinion in the United Nations will shrink more and more from renewing the war; and the Communists will raise their demands accordingly. Before they are finished they may be demanding not only Formosa and a seat for Red China on the Security Council, but also a review of the Atlantic Pact. Naturally, the United Nations will never accept such terms, but they will be fortunate if they emerge from this haggling with knaves without suffering either material or spiritual damage.

Both armies in Korea, Chinese and United Nations, have been the prisoners of logistics. With their limited resources in transport, rubber, and petrol, the Chinese have been particularly affected. General MacArthur reckoned that they might be able to maintain one million men on the Yalu; 500,000 at Pyongyang; not more than 250,000 as far south as Chunchon.

The Eighth Army, similarly, in its periodical advances has had to count every yard it went northward. For two obvious reasons: first, because it has brought the Yalu dead-line for United Nations bombing by so much the nearer; secondly, because, as the Chinese communications have shortened, the United Nations communications have lengthened and the numerical balance has shifted accordingly.

Command of the sea does not rid the United Nations of their logistic shackles. There is a limit on the extent to which the opening up of new bases during an advance can solve the problem. General MacArthur told me, for instance, that, after the Inchon landing and the taking of Seoul, he had been on the point of putting the 10th Corps under command of the Eighth Army. In view of General Walker's representations, however,

that he could not maintain the 10th Corps through Pusan and other west coast ports, General MacArthur had to tranship the 10th Corps to the east coast and operate its several divisions on separate axes during the further advance beyond the 38th Parallel. The fact that, during their subsequent withdrawal from the Yalu, the United Nations forces made too thorough a job of demolitions, has further limited the possibilities of opening new lines of communication by sea. It was scarcely necessary, for instance, to demolish the port of Inchon—so soon to be needed again—since the United States and British Fleets were perfectly capable of blockading it.

At or near the 38th Parallel, therefore, logistic limitations have brought the two sides into uneasy stalemate. Subsequently the operations have proceeded in a vicious circle. The United Nations forces, despite their great superiority in fire power, have lacked the numbers required to hold a permanent defence line across the peninsula. These forces consist of seven United States divisions, the equivalent of two other United Nations divisions, and up to seven R.O.K. divisions in the front line—and, from sea to sea, the front is at least 110 miles. Moreover, the R.O.K. divisions are a doubtful quantity.

When the Chinese have built up for one of their periodical offensives, therefore, they have been able to break through by sheer weight of numbers. Fighting a battle of manœuvre, the United Nations forces thereupon have counter-attacked mainly by fire, while disengaging to a depth that would overtax the Chinese supply system. Thus the Chinese forward troops have soon outran their ammunition and food, while suffering great losses.

The Chinese in their turn have fallen back on to their supplies, and almost all contact has been lost. While the Chinese have regrouped, the United Nations forces have resumed their cautious advance on very wide fronts. Feeling forward, they have ultimately reached the Chinese covering position. Then the cycle has started afresh. The Chinese, no doubt, have lost ten—twenty—thirty men to the United Nations one—but there are many Chinese, whereas United Nations soldiers are precious. Meanwhile the backwash of refugees has flowed to and fro and the countryside has become ever more devastated.

The large Red Air Force which has appeared on Manchurian airfields is a new factor introduced into this equation. This Air Force, however, would certainly be a two-edged weapon. Admittedly, their immunity from air attack has taught the United Nations forces bad lessons. The Red Air Force at first would find excellent targets behind the United Nations front, in the combat zone, on airfields, in base ports and even in Japan. On the other hand, the United Nations' riposte to an all-out Red air offensive would certainly extend to the hitherto "privileged sanctuary" beyond the Yalu—a retribution which the Communists may not be willing to incur. It may well be, therefore, that the Red air concentration in Manchuria will remain primarily preventive and deterrent.

To the Chinese, time means nothing and lives not very much. The Western nations must consider both, however. It was his conviction that the United Nations forces could not reach a decision in Korea itself that led General MacArthur to the conclusion that the fight must be

extended—though not by United Nations land forces—to the seat of Communist power in Red China itself. The whole free world—and General MacArthur with it—must now share the hope that events at Kaesong will prove him wrong. Even if a Cease Fire should come, however, that would not be the end of the story.

2. CHARACTERISTICS OF THE COMBATANTS

I shall begin my survey with a description of the North Koreans. For two reasons: first, because it was they who began the war; secondly, because the original North Korean Army has provided us with our best example so far of the new-model Communistic army in action.

General MacArthur, as he himself told me, regards the original North Korean Army as an almost perfect fighting machine. It was formed largely of veterans with service in many theatres including Stalingrad. The Russians had been training and equipping it for two years. They had provided it with 1,000 excellent medium tanks and a powerful artillery.

All his life, General MacArthur said, he had longed to command troops who could fight at night—but he had never had his wish. If his troops could make their approach march during darkness and attack at dawn—without losing themselves for the next three days—then, he thought, they had done well. But the North Koreans of June 1950 would approach the battlefield at a jogtrot, covering thirty miles a night, night after night; and at the end of it all would put in a brilliantly staged night attack. They climbed like goats; were adepts at infiltration tactics; and had a complete disregard for human life—their own or their enemy's.

In siting their defences, the North Koreans had a sound appreciation of the value of command: they were to be found always on the tops of the highest mountains. These mountains, incidentally, are often as high as Ben Nevis and very much steeper and more knife-edged.

The North Koreans used to dig in either on or just behind the crest-lines—and they dug like moles. Their trenches were deep, narrow, and undercut to give overhead cover. They had learnt the art of camouflage to perfection, concealing their trenches with matting and exercising rigid track-discipline. Their machine-guns and light automatics they sited a little way back down the spurs on the reverse slopes, in readiness to sweep the crest-line above.

When the attack came in at them up the forward slope, the North Koreans would wait in their trenches till the supporting fire had lifted. Then they would emerge to lob their grenades over the crest-line. In Korea the grenade has come into its own once more.

If the attackers pushed through this grenade barrage and over the crest, the North Koreans would open up on them with their machine-guns and light automatics when they were silhouetted against the sky. Alternatively, if the attack came in along the knife-edge crest, the North Koreans would try to block it by holding a position that could be attacked on little more than a one-man front.

In their hurricane advance from Inchon to the Yalu in autumn 1950, the United Nations forces utterly destroyed this original North Korean Army. The fact that this operation ended in near disaster to the United

Nations' cause has tended to obscure the brilliance of its conception. In September 1950 the United Nations forces in the Pusan bridgehead were under such pressure that collapse seemed imminent. So desperate was the situation that General MacArthur had just told the British Government that two weak battalions from Hong Kong then and there would be worth many times the numbers later. And, on their arrival, these two battalions had been put in at once to hold almost a divisional front on the Naktong River.

Such was the background against which General MacArthur had to decide what to do with the 10th Corps, his only reserve—a force of under two divisions about to arrive from overseas. A lesser man would have played safe—that is to say, would have used the reserve to bolster up the hard-pressed Eighth Army in the bridgehead. Instead—and against the almost unanimous advice and warnings of his staff and subordinates—General MacArthur actually withdrew the Marine regimental combat team already in the bridgehead, and sent the 10th Corps, thus completed to two-divisional strength, to land at Inchon and cut the enemy's communications. This most hazardous operation, carried out apparently by a quite inadequate force and at great jeopardy to the main body in the bridgehead, was entirely successful—and the enemy was destroyed. As an example of nerve and the acceptance of calculated risk General MacArthur's decision is likely to be regarded as outstanding in the history of generalship. That the subsequent intervention of the Chinese robbed the United Nations forces of final victory cannot effect this claim.

So much for the North Korean Army of 1950. I have discussed it in some detail because the Chinese Army is built much to the same pattern, and displays similar qualities that differ only in degree.

The North Korean Army of 1951 is an entirely different affair. The veterans, the fanatical Communists, are mostly dead or prisoners of war. Viewing the utter devastation of their country after a year, the rest can have little heart left for this war that they themselves began.

Numerically, of course, the Chinese Communist Army is infinitely stronger than the original North Korean. In most other respects, however, the Chinese Army—in General MacArthur's opinion—is inferior. Being more highly civilized, the Chinese lack something of the North Koreans' brutal élan. Prior to their offensive of April 1951, too, the Chinese employed very little artillery—and their handling of what little they did employ was futile. At the time of writing, information is not available as to whether or not they handle these later and larger concentrations of guns more effectively. So far they have employed almost no armour.

The Chinese are dumbly tenacious in face of hardship and losses; dig even more assiduously than the North Koreans; are even more adept at camouflage; have equally good track discipline; make even better use of ground. For the rest, the Chinese Army has lost the awe-inspiring reputation it once enjoyed. To-day it is recognised for what it is—a mass army formidable mainly on account of its numbers and the peculiarities of the Korean hills to which its Chinese tactics—with their Japanese veneer—are ideally suited.

In the Korean hills—and that means everywhere in Korea—the main roads run along the bottom of the valleys. In the early days of Chinese intervention both Americans and Chinese would use these main roads

during their approach marches preliminary to an encounter—but the Chinese would use them by night only. Before dawn the Chinese striking force would pull off the main roads and up into the side valleys, where they would hide themselves with extraordinary skill and thoroughness—a whole battalion packing into perhaps twenty huts. There are also convenient stretches of woodland almost everywhere. Meanwhile, the Chinese covering troops would occupy a blocking position across the main valley, with orders to hold on to the last man.

Presently the Americans would come along the main road, all unconscious of the presence of the Chinese in the side valleys. Passing the entrance to these side valleys, they would hit the Chinese covering troops in their blocking position across the main valley. When the Americans were fully engaged, the Chinese striking force in the side valleys would emerge; but, following the trend of the side valleys, they would hit not the Americans' front but their flanks and rear. It was the shape of the country that lent itself to these Chinese infiltration tactics. Now that trick is played out.

So, too, is the Chinese trick of heralding their night attacks with a blood-curdling din of bugles, whistles, and shepherds' pipes. The Eighth Army has conditioned itself to these noises, and now awaits these night attacks with confidence, in positions well wired and mined.

The Chinese do not adapt their tactics readily to meet the unforeseen; are poorly armed and poorly trained in the handling of their weapons; and, once committed to battle, are left pretty much to their own devices in regard to replenishments of ammunition and food. The Chinese soldier who is issued with a greatcoat or blanket in winter is a lucky man indeed.

When the Chinese have used "human sea" tactics they have come on and on quite regardless of casualties. The number of occasions on which they have used these tactics, however, appear to have been few. Normally they attack under fire very much like other people—in rather ragged formations.

Much remains to be learnt about Chinese tactics, which still present many enigmas. How and why do the Chinese break contact periodically—to all appearances, completely? They transgress thereby one of the cardinal rules of Western military behaviour—that "touch once gained should never be lost." Presumably, they argue as follows: "Our object is to destroy the enemy; for the moment, however, we are not ready to continue; meanwhile ground means nothing to us, so why should we endure the fury of the United Nations bombardment; let's get back out of it." So back they go.

How, again, do they successfully deceive all the agencies of United Nations' intelligence—not once or twice but repeatedly? Areas in which the presence of one or two Chinese armies has been confidently reported are traversed by our fighting patrols—and drawn absolutely blank. Conversely, the Chinese could bring up the large concentration of guns that supported their April offensive—and yet not an inkling of the presence of these guns seems to have been revealed by photographic reconnaissance or otherwise. And they could launch a massed attack on the Imjin front without a whisper of previous warning reaching the 29th Brigade in their path. Discipline—intelligent use of cover—an absolute embargo on daylight movement—that, I suppose, gives the answer.

Immediately before this April offensive I spent a night at a United States corps headquarters in Korea. The Corps commander took me to his staff's evening and morning briefings in the war-room. The corps intelligence officer gave the usual reports of Chinese lorries by the hundred—or thousand—moving southward into the build-up area Chorwon-Kumhwa-Hwachon. "This has been going on for weeks," objected the corps commander, "and never a darned truck goes back north. Right now, that area must be solid trucks." Perhaps it was—or perhaps, as the corps commander inferred, there was something wrong with the intelligence he was getting.

So much for the general characteristics of the enemy. Let us turn now to the United Nations forces.

Of these, the South Korean Army does not strictly form part, though it fights under the same flag. Racially, North and South Koreans are one and the same people; though—as is so often true elsewhere—the northerners may tend to be the tougher citizens. The South Koreans, moreover, got off to a bad start. In the opening phases they were hopelessly outmatched by the better equipped North Koreans. Subsequently their morale has fluctuated with the vicissitudes of the campaign. They are now fully a match for the North Korean Army, vintage 1951. They are not yet, however, a match for the Chinese. The reasons are these. In regard to the Chinese, all Koreans begin with a hereditary sense of inferiority. And this sense is accentuated in the South Korean Army by a further sense of military inadequacy. This fact was brought home to me not so long ago when I called at the headquarters of the 1st R.O.K. Division, then located in the outskirts of a Seoul much less devastated than I had expected to find it. The Divisional Commander was General Paik, who has now been selected as the only South Korean representative at the armistice talks at Kaesong. He gave me a ceremonious welcome and took me to his war-room to explain the situation. At that time the British 45th Field Regiment—which I was on my way to visit—was supporting his South Koreans on the Imjin front. Paik explained to me that his division—though it consisted of the normal quota of infantry—was still almost entirely devoid of supporting arms; and he was obviously delighted to have the temporary support of the 45th Field Regiment. General Paik is regarded as one of the best of the South Korean commanders. In all three of the successive Communist offensives against Seoul, he and his 1st Division have fought in this same western sector of the line. The friendly admiration that he feels for British troops is, I gather, reciprocated. Brigadier Brodie, commanding the 29th Infantry Brigade, was then—and no doubt still is—firmly of the opinion that, given good leadership and adequate support, the South Koreans would be first-class troops.

There is no denying the fact, however, that they are extremely temperamental. There have been very many instances of their sudden dissolution in panic; of these, at the time of writing, the rout of the 6th R.O.K. Division by the Chinese in April on the central front, and of no less than three R.O.K. divisions on the eastern front in May, are the latest examples. This Chinese offensive in April came at the end of a long and cautious advance by the United Nations forces, in which the 27th Commonwealth Brigade, operating on the extreme left of the United States 9th Corps, had cleared a knot of lofty and difficult mountains north of Kapyong. This

done, the 27th Brigade had been withdrawn into Corps reserve ; and the 6th R.O.K. Division had taken over the brigade's 8,000-yard front in the mountains. When the Chinese struck, the 27th Brigade was in process of handing over to the 28th Brigade, prior to the return of 27th Brigade headquarters and its two British battalions to Hong Kong. The unprecedentedly heavy Chinese artillery and mortar bombardment dismayed the South Koreans, who broke in panic, throwing away their arms. Brigadier Brian Burke, commanding the 27th Brigade, had only just time to get his troops back into the corps reserve position when the South Koreans came streaming by, closely followed by the Chinese. For two days the situation remained critical, but the 27th Brigade held its ground, mowing down the Chinese—according to observers—"by thousands." That magnificent battalion of individualists—the 3rd Battalion, Royal Australian Regiment—bore the brunt of the attack, and broke it, fittingly, on Anzac Day. The Chinese, frustrated, decided to try elsewhere.

It is probably inevitable that the South Koreans, witnessing the devastation of their country, should share something of the North Korean's sense of futility and frustration. None the less, they continue to co-operate readily enough with the United Nations forces. Every British battalion, for instance, has its 200 or so Korean porters, whose duty it is to bring up ammunition and supplies to the mountain-tops, and to evacuate wounded, in all conditions. The general experience is that these porters, all things considered, do their jobs with remarkable fidelity—though admittedly desertion is fairly common. Like primitive man the world over, these porters respond to good treatment and understanding. Shortly before he was killed in the Chinese April offensive, Lieutenant-Colonel Kingsley Foster, as he told me, had occasion to address a new batch of porters posted to his battalion, the Royal Northumberland Fusiliers. He told them that they would be fed and paid and treated as part of the battalion. Their response was immediate though unexpected. They gave him to understand, through a deputation, that, if he would stand for President at the next election, they would vote for him instead of for Syngman Rhee.

Of the United Nations forces proper, the United States contingent is, of course, infinitely the largest, consisting as it does of six army divisions and one Marine division, all up to their very high establishments, plus powerful corps and army artillery and other non-divisional troops. Second in strength is the Commonwealth contingent, which will soon be organised as the 1st Commonwealth Division, comprising the 25th Canadian, the 28th Commonwealth, and the 29th British Brigades.

The other United Nations contingents together amount to about another division.

This force of about nine United Nations divisions, plus as many more somewhat unreliable South Korean divisions, has had to deploy on a frontage across the peninsula that at its narrowest amounts to 110 miles. In consequence, whether in attack or defence, the Eighth Army has never presented a continuous front or been disposed in any depth. It follows that, whenever the Chinese have built up for one of their periodical offensives, they have found a way through—in precisely the same way as, after German manpower had been depleted in the later stages of the war on the Eastern Front, the Russians could find a way through whenever

they had built up for an offensive. Lacking depth and reserves, the Eighth Army in these circumstances has had to do exactly what the Germans did—that is to say, it has had to fight a battle of manoeuvre, trading ground for lives. It follows that, at some stage in every defensive battle and on some part of the battlefield, the Eighth Army has had to carry out a fighting withdrawal.

To such situations the lessons of the 29th Brigade's Imjin battle seem generally applicable. At the beginning of that battle in late April the brigade was holding almost a divisional front, with its three battalions disposed on three vital, but not mutually supporting, features. The Chinese flooded round all three battalions. "C" Squadron of the 8th Hussars—the only squadron which the Commanding Officer could employ—opened communications to each battalion in turn but could not keep them open. By the third day of the battle the infantry were completely exhausted and quite unable to disengage on foot. They had to be lifted on "C" Squadron's Centurions—or what was left of them—with the result that these soon became inoperable. Thus losses were greatly increased.

If armoured personnel carriers (A.P.O.Cs.) had been available—say, of reliable Sherman type—the story would have been very different. While these A.P.O.Cs. lifted the exhausted infantry, the Centurions could have performed their proper role of covering the withdrawal. Lightly armed Chinese will always move much faster across country than will our own troops. This need for A.P.O.Cs. is, I understand, now recognised.

The Centurion has done all that was expected of it in Korea and has greatly impressed the Americans. Moreover, the feeling that they have got the best tank in the theatre is a great morale raiser to our troops. The Centurion, however, is too good for its job. Armed with its superlative 20-pdr. gun, it would be unrivalled in the tank versus tank battle; but the Chinese have produced no tanks to oppose it. The Russians have now outfitted the Chinese with an effective high-velocity 57-mm. anti-tank gun. In the main, however, the Chinese wage a wholly unorthodox anti-tank war—a war of Bangalore torpedo and bazooka, of sticky or magnetic bomb and hand grenade. They bank on the fact that Korean roads are narrow, and that tanks can neither pass on them nor leave them. Their object is to immobilise the leading tank of a column and to destroy the rest as they pile up behind it. That is exactly what they did to the 8th Hussars' reconnaissance squadron of Cromwells, which they destroyed in the Happy Valley during the withdrawal on Seoul.

For Korean work, the Centurions at forty-nine tons are too broad in the beam and too heavy despite their well-distributed track-pressure. There is always the danger that one may get bogged or strip a track. If it does, then that road is closed for anything else behind it. At first this danger was all the greater because the infantry, who are always the pre-dominating partner in these operations, were apt to ask the impossible of their tanks. They would tell their tanks not only what to do but also how to do it. It is the old story, heard so often in the days of cavalry, that instructions on these occasions are usually better than orders.

In the Imjin fighting, too, the Centurion crews felt the absence of a lap-gunner with his hull machine-gun. Tanks, it appears, inspire no awe in the Chinese soldier's breast. He closes on them on foot from all quarters,

and swarms all over them in his endeavours to find some aperture through which to insert his grenades.

The Centurion is not designed for this sort of rough-and-tumble. Its official armament is limited to its 20-pdr. and its coaxially mounted Beza. The place of a lap-gunner with his hull machine-gun is taken up by an extra ration of 20-pdr. ammunition—indispensable, no doubt, in tank versus tank warfare.

A hull machine-gun would have helped to keep the Chinese at arm's length and to cover the tank ahead. As it was, the Centurions found themselves crushing Chinese under their tracks, or scraping them off their roofs by driving through houses. And several Centurions were lost—but it is surprising that the losses were not much greater.

As a remedy the 8th Hussars now mount a Browning in the commander's cupola. With this he can pick off any trespassers on the tank ahead. Also, each Centurion now carries a ration of grenades which the crew can toss out if the Chinese should grow too intimate.

In this sort of fighting the Centurion's automatic stabiliser—which is designed to enable its 20-pdr. gunner to fire on the move—is certainly not worth the space it occupies or the considerable care and maintenance it demands. Indeed, many fighting vehicle experts hold that in no circumstances will the stabiliser ever be worth its keep, since tanks should fire at the halt or not at all. Certainly, the Centurion's present four-man crew is definitely insufficient to carry out all the maintenance work that the Centurion requires.

The Centurion is obviously much too large and costly to be used for reconnaissance work. Thus, in the absence of their Cromwells, the 8th Hussars have to rely for reconnaissance purposes on armoured cars that have no cross-country capacity at all. There is an evident need here for an adequate reconnaissance vehicle with sufficient mobility and armour.

In the attack, the recurring question is, of course, how best to produce fire and movement against crest-line positions such as I have described.

Fire may be produced in a host of ways, but principally in the form of air strikes, artillery fire or heavy mortar fire. Air strikes with napalm—that is to say, with jellied petrol—are a cure-all for the deepest trenches—but always with the proviso that the strikes hit the right spots.

Significantly, perhaps, Chinese front-line prisoners reiterate that they fear artillery fire much more than air strikes. Behind the front, on the other hand, the effect of napalm is devastating. The utter destruction of former enemy maintenance areas such as Chunchon has to be seen to be believed.

Since the United States Air Force produces most of the fighters to answer calls for air support, the methods in use are its methods. At the forward command post or O.P. of each regimental combat team or brigade group there is a fire control co-ordination group, consisting of a tactical air control (T.A.C.) officer with two wireless sets, a tank liaison officer, and an artillery liaison officer, the last representing the C.R.A. Calls for fire from forward companies reach this fire control co-ordination group through battalion and regiment or brigade. In the 27th Brigade it was the brigade commander's practice to depute control of that group to the C.R.A. The C.R.A. or his representative must then decide whether

the air force or the guns shall answer the call. This is important since, if there is to be an air strike, all the artillery and mortar fire across the whole regimental—or brigade—front must cease, with the possible consequence that other units will find themselves deprived of their support at a critical stage of their advance. The reason is that, owing to their high speed, jet aircraft over-shoot their targets by long distances ; and that they dislike flying through a lot of stuff.

If a strike is decided upon, the T.A.C. officer arranges matters with "Mosquito Control" at corps headquarters and with the fighters, all of whom are on the same net. The Mosquito so-called is a small aircraft of Harvard trainer or AT-6 type which is already up over the battlefield in readiness to act as guide for the fighters. It identifies the targets by means of co-ordinates, usually verified by phosphorus smoke fired by infantry mortars or recoilless guns, or by the United States artillery. The base-ejection smoke fired by British artillery is not so suitable for this purpose.

The Mosquito then meets the fighters at a pre-arranged rendezvous and orbits them in. They usually make several "dry passes" before they attack. Each carries an armament in the nature of two rockets, two napalm bombs, and 16,000 rounds of 0.6-inch ammunition.

Owing to their high rate of fuel consumption, jet fighters cannot remain long in the air. The "cab rank" system is, therefore, unsuitable. Instead, jets carry out sorties at fixed hours. Calls for air strikes must either await these prearranged sorties or must be met by fighters on the ground, which latter are likely to take an average of about 50 minutes to reach their targets. Propeller type aircraft of Mustang type are better for this job.

Tactical air support is not yet foolproof for a number of reasons, among which are these :

1. It is human nature to exaggerate the size and lucrativeness of a target, in order to get it placed high on the controller's priority list for incoming flights.
2. Strikes asked for at prearranged times to synchronise with ground operations often do not happen to schedule.
3. T.A.C. wireless sets are so delicate and bulky that they greatly limit the T.A.C. officer's mobility.
4. Target indication is still extremely difficult, especially in attack or when the enemy have broken through. The enemy have learnt to fire marker rounds of white phosphorus into our lines and to make use of our captured pannels.
5. In the British view there are far too many people on the T.A.C. officer's net—so much so that he sometimes takes a very long time to get through to the controller.

The Mosquito Control, incidentally, also figures prominently in supply dropping. Supply aircraft, after having been loaded by the Army Transportation Corps at the Air Force base in Japan, are told where to tie into the army supply net in Korea. Mosquito Control at Corps Headquarters then takes over and brings them to a rendezvous with the

Mosquito, which guides them to the divisional or other dropping zone which it has already reconnoitred.

Where air strikes are ruled out, the artillery continues to be the infantryman's most trusted friend. Up to the time of writing, the field artillery of the Commonwealth has been represented in Korea by the 45th Field Regiment, Royal Artillery, and the 6th Field Regiment, Royal New Zealand Artillery, both armed with 25-pounders. Both have done magnificently. In the Imjin battle at the end of April the 45th Field Regiment fired 30,000 rounds in 60 hours in support of the hard-pressed infantry of the 29th Brigade. When its own gun lines were attacked, the 45th Regiment blew up Chinese at point-blank range. About the same time the 6th Field Regiment was giving magnificent support to the Australians and Canadians in the 27th Brigade's last battle. A field regiment of Royal Canadian Artillery has since arrived.

The war-tried British system of pairing the artillery regimental commander with his infantry brigade or regimental commander, and his battery commanders with their respective infantry battalion commanders, has continued to ensure in battle a close understanding between artillery and infantry.

The United States Artillery, on the other hand, usually deputed much more junior officers to accompany the infantry as forward observation officers. The consequence is—or so well qualified observers hold—that the United States Artillery, though technically extremely efficient, is apt sometimes to fight an artillery war of its own, tactically independent of the infantry. During the Chinese withdrawals, for instance, when almost all touch had been lost, it was noticeable how the United States Artillery would continue to fire harassing and defensive fire tasks almost automatically—rather as an artillery exercise than in response to their infantry's needs.

Though the British 25-pounder field gun has to give its opposite number, the United States 105-mm., best in range and weight of shell, it more than compensates for these short-comings by its ability—which it owes to its portable platform—to engage targets with equal facility in any direction all round the compass.

The 105-mm., on the other hand, has an arc of fire of 40 degrees and no more. When a new target appears outside these limits—a habit targets have in Korea—the gun crew of the 105-mm. must up with its trail, swing it round, and dig it in afresh. In frozen ground the 105-mm. may be out of action for an hour or so in consequence.

In one respect, however, the United States artillery generally is out ahead: it makes great use of V.T., or radio proximity, fuses to burst its shells at predetermined heights above the ground. Against troops unprotected by head-cover this form of fire is deadly. For meeting Chinese mass attacks our guns should certainly be provided with the V.T. fuses which they now lack.

As a means of deluging an area with fire, heavy mortars are of course an indispensable supplement to the guns. Our heavy mortars in Korea are represented by the 170 Independent Mortar Battery, R.A., one of whose troops shared with the 1st Battalion, the Gloucestershire Regiment, the honour of a Presidential Citation for their devoted stand together on the Imjin River.

The United States and our own heavy mortars are both of 4·2-inch calibre, but here the similarity ends. The United States 4·2-inch is much the better weapon; it is rifled and it fires a well-finished, engine-turned bomb actuated by a time or percussion fuse. Our 4·2-inch, on the other hand, was produced in 1916 as a trench-warfare weapon for deluging areas with gas. Neither range nor accuracy was then of great moment. True, these have since been somewhat improved by giving the mortar a base plate; but it remains a makeshift weapon.

The worst point about our 4·2-inch, however, is its faulty ammunition. Its powerful but rather rudimentary bomb is stabilised by a tail-fin that, in a small but irreducible number of cases, parts company with the bomb in flight. The bomb then falls far short of the target. Already several of our own men have met their deaths in Korea from this cause—and there is nothing that can be done about it.

The War Office, I understand, have approved the prototype of another, much more accurate and more powerful, heavy mortar. The troops—and not least the men of the heavy mortar batteries—will welcome its appearance. It is long overdue.

So much for fire: as for movement, the question ultimately boils down to this—how to cover the last fifty yards or so, up to and over the crest, in face of the Chinese grenade barrage?

I heard the matter debated at Chunchon by Colonel Arbucis of the Greek battalion—with some eleven years of almost continuous combat service to his credit—and Colonel Harris of the 7th (Garry Owen) Cavalry Regiment, a distinguished component of the United States 1st Cavalry Division. They agreed that forward troops who go straight through the grenade barrage and over the crest with the bayonet will do their job with the minimum of loss. A “fire base”—that is to say, some medium machine guns—must move up with them on to the crest, however, and establish themselves there without delay, in order to deal with the enemy automatics distributed on the reverse slope.

Let me tell, too, how the 3rd Battalion, Royal Australian Regiment, do it. At the time of my visit this magnificent battalion of volunteers had already had the highest casualties of any unit in the 27th Commonwealth Brigade—casualties, be it noted, of which only three were listed as missing. Subsequently, the battalion has borne the brunt of the Chinese April offensive on the central front. The following description was given me by an observer who had seen them in all of their most difficult attacks.

The Australians, individualists ever, approach their start line rather casually. Then they coalesce. These tall men in their slouch hats spit on their fingers and set their sights. Then, with arms at the high port, they set out. Men fall—many men—but the rest do not pause. Nothing can stop them. At last they shoot it out with the Chinese at point-blank range.

During its periodical advances the Eighth Army's formation have been operating on very wide fronts. When I visited the United States 24th Division in March, for instance, it was advancing through difficult, almost roadless mountains, on a 28,000 yards front, with the 27th Brigade under its command on an 8,000 yards front. Such frontages were, and are, inevitable. United Nations troops are relatively few; yet they must sweep the whole countryside from sea to sea if they are not to leave behind

them indefinite numbers of Chinese to work mischief in their rear. The Chinese are to be sought on the tops of the highest mountains. It is there, too, that the United Nations troops will be found to-day—come winter cold or summer heat. Theirs is no longer a road-bound army.

So much for the United Nations forces in the attack: let us examine now some aspects of defence and withdrawal.

In the earlier stages of the campaign certainly, the United States conception of defence and withdrawal appears to have differed fundamentally from our own. To the United States forces defence was a fluid operation and equipment was expendable. British troops, on the other hand, were slower to withdraw, and regarded their weapons and equipment as sacred. This divergence of doctrine was bound to lead to misunderstandings in battle. After his arrival as Eighth Army Commander, however, General Ridgway set himself to restore morale and to inculcate a common doctrine. In the outcome he transformed the Eighth Army.

Certain differences in outlook still remain, however. When a United States battalion is holding a defensive position in the forward area, for instance, it is its practice to put out outposts a couple of thousand yards or more in front of the main position. Those outposts may consist of a rifle company per battalion, or they may be found by the forward companies in the main position. Normally, those outposts have orders to withdraw only when told to do so by their battalion commander.

British objections to this system are three-fold. First, the outposts are liable to be isolated and overrun in their forward position. Secondly, if they have to be withdrawn, their withdrawal is not easy to co-ordinate with that of neighbouring battalion outposts. Thirdly, if and when the outposts fall back, the enemy is apt to arrive on the main position intermingled with them.

Those of our commanders with whom I discussed this question prefer to dispose all four rifle companies of their battalions in "boxes" as tight as their frontages will permit and covered by all available mortars, medium machine guns, and artillery. There in their "pup" tents or double poncho shelters—with a couple of blankets and the dry rice straw they have prudently gathered during the later stages of the move, our men have learnt to withstand any cold. They have learnt, too, from unforgettable sights that they have seen, that zipped-up sleeping-bags, however alluring, are death-traps in the combat area.

From these boxes, forward battalions send out patrols to any depth required, and they vary their orders about security generally—that is to say, about sentry groups and standing-to in their two-men weapon pits—to suit the circumstances.

Battalions thus disposed can meet massed Chinese night attacks with confidence. It is questionable, however, whether the present establishment of six—and indeed in some instances no more than four—medium machine guns per battalion is enough. Just before the Chinese April offensive in which the battalion was to win undying fame, Lieutenant-Colonel Carne of the Gloucesters discussed this question with me. With prophetic vision, he argued that, even in this hill country, the medium machine gun is the best weapon for meeting Chinese massed attacks; but that six are not enough to provide forward, supporting and reserve guns to cover four rifle companies.

Moreover, these rifle companies must be maintained at reasonable strength. Throughout their eight months' campaign the Middlesex and the Argylls were kept far under strength: so much so that at one time the proposal was seriously considered to amalgamate the two battalions, and, at another, orders were issued to reduce each of them to three rifle companies. It was inexcusable to keep battalions so weak in such a campaign. The reason, no doubt, was that the War Office was unable to find adequate drafts because of the nineteen-year rule which applies to the Korean theatre. There is no doubt that, sentiment apart, arbitrary age rules applied to particular theatres make the War Office's manpower problem almost insoluble. The only practical course is to regard every young soldier, who has completed his basic training and who is of the requisite medical category, as eligible for service anywhere.

To put a battalion properly on the ground—in its box as described above—takes time and daylight: a fact apparently not always realised by divisional and corps commanders in Korea, certainly in earlier days. If warning orders for the night had not come in during the course of the afternoon, our brigade and battalion commanders would very properly begin to feel the want of them. A battalion which has to make its defensive dispositions after dark cannot be in much shape to meet a night attack.

When it comes to a withdrawal, United States troops from all accounts get on the move much more quickly than ours and with much less formality; and they normally complete their move under much less centralised control. In comparison, our ritual of "O" Groups held at descending levels undoubtedly takes time, though no doubt it results in a much more thorough briefing of the individual soldier. Well-qualified British observers hold the view, however, that we have a good deal to learn from the Americans about quick movement.

I have already referred to the unfortunate effects of indiscriminate demolitions during the winter withdrawal. In future, no doubt, the General Staff will lay down a more clearly defined policy—and the inevitable tendency to blow bridges ahead of schedule will be checked.

3. MISCELLANEOUS POINTS

The absence hitherto of enemy armour and of an enemy air force has put certain weapons out of a job altogether, and has put others to purposes for which they were not intended.

Up to the time of writing, for instance, there has been no role for the infantry's 17-pounder anti-tank platoons. If it had been provided with high-explosive ammunition, the 17-pounder might have carried out a useful subsidiary role in close support. It has no H.E., however; so it had been out of a job altogether.

Similarly, in the absence of enemy aircraft, the 40-mm. guns of the 11th (Sphinx) Light A.A. Battery have had no opportunity to carry out their primary role.

The battery, however, has been used with success to give close support to the infantry of the 29th Brigade. Its role has been to move along the valley bottom and to support the infantry along the crest-lines on either hand. The 40-mm. gun can get the necessary elevation where tanks



Explosion of Napalm Bomb



North American Aviation RB-45C 4 Jet Bomber for photo-reconnaissance duties



British Soldier (Royal Engineers) with Mine Detector

cannot. On the other hand, in face of enemy mortar and machine-gun fire, the anti-aircraft detachments are very naked.

Our armour in Korea has been represented by the Centurions of the 8th Hussars—of which I have already written—and the Crocodile flame-throwers of "C" Squadron, 7th Royal Tank Battalion.

At the time of my visit, the Crocodiles (Churchills) of the 7th Royal Tanks had yet to meet an enemy within range of their flame. The reason was, of course, that the Chinese were usually to be found on the hill-tops; while the capacity of the Churchills to manœuvre off the roads was very limited. In consequence, the Churchills had been used as gun-tanks only.

The feeling then was that some of these Crocodile flame-throwers could very well have been replaced by Flail tanks, which would have been invaluable for dealing with the Chinese box mines. The whole policy, however, of employing old and mechanically unreliable Churchills on Korean roads is highly questionable. There is no more effective road block than a broken-down tank.

The very difficult going in Korea has provided a most searching test of every form of transport. Heavy traffic, intense frost, snow, thaw, torrential rain, all these have played havoc with the narrow mud roads. On the mountain tracks gradients are very steep. Practically all the high-level bridges have been destroyed. Bailey bridging appears to be in very short supply. In consequence, even on the main supply routes, there are frequent fords to be crossed, of depth varying directly with recent rainfall.

In consequence, two-wheel drive vehicles such as the British 15-cwt. truck have proved useless. Reconditioned four-wheel drive Bedford lorries have done good service. It is generally agreed, however, that there is no British transport comparable with the United States 2½-tonner, which drives on all ten of its double wheels. This remarkable ten-by-ten makes light of the worst of going; where the going is good, moreover, it will carry up to 5 tons comfortably.

About the merits or demerits of the universal carrier there was a very sharp divergence of opinion. Generally, the view seemed to be that they were obsolete and worn out—much more trouble than they were worth. And some battalions had managed to replace them by jeeps and trailers. At least, one battalion, however, the Middlesex, remained firm believers in their universal carriers—which continued, in consequence, to give good service. There was general agreement that the new Oxford carrier is a good job.

At the time of my visit in March, the real cold was over. It was the general view that we have not yet solved the problem of winter clothing. The string vest and jersey are excellent. The "Boots Finnish Pattern" were evidently old stock: many fell to pieces at once; the rest were satisfactory in dry cold but absorbed melting snow. The windproof jacket and trousers certainly keep out the wind, but are neither warm nor waterproof. The large and clumsy sleeping-bag does not compare with the light and compact "mountain sleeping-bag" issued to United States troops—and even the mountain sleeping-bag, it must be repeated, has proved a death-trap in the combat zone.

No winter lubricant for weapons was issued to the troops, though apparently it should have been available. Experience proved that working

parts should be kept almost dry; and that weapons should not be brought in out of the cold lest they sweat and subsequently freeze up. These lessons tally exactly with the teaching in the Swedish Army, as I learnt on a visit to it at training in northern Sweden last winter.

That our men survived the winter in Korea almost unprovided with tents and "space-heaters"—the Americans' ingenious petrol stoves—was due mainly to the fact that, having nothing then to fear from enemy air or artillery, they could generally congregate in Korean houses for shelter. Also, with their usual readiness to help, the Americans passed over to our troops a certain number of tents and heaters. In the altered conditions of another winter's campaign, however, a larger and more regularised allotment of both would certainly be necessary.

The helicopter is a form of conveyance that is likely to come into greatly extended use as a result of the Korean campaign. There are two types of helicopter in use in Korea—the Bell HTL-4 and the Sikorsky HO3S. Both are extensively used for carrying commanders and staffs from door to door, as it were, ahead of the foremost airstrips from which the United States Army's excellent "L" series of light, fixed-wing, intercommunication aircraft can operate. They are used, too, for reconnaissance—particularly engineer reconnaissance—behind the front. And, above all, they are used for the evacuation of wounded, who would otherwise have to face the long-drawn agony, first, of the carry down the hillside and then of the almost endless drive over execrable roads. Incidentally, for the evacuation of wounded in mountainous terrain such as that of Korea, the helicopter must be able to take off fully loaded from an altitude of at least 5,000 feet.

Unfortunately, there have not been nearly enough helicopters in Korea. In the last ten years the total production of helicopters in the United States has been under 2,000. They have not yet got beyond the state of initial development. Costs are high; teething troubles countless. For every hour in the air, I was told, a helicopter in Korea requires at least an hour's maintenance on the ground. At the time of my visit a divisional headquarters in the United States Army had only one helicopter on charge, but a recommendation had gone forward that this figure should be increased to ten. The 1st Marine Division already had six. And the U.S. Marine Corps now aims to provide for each Marine division and brigade one observation squadron, to consist half of helicopters—four-seater Sikorsky HO5S—and half of "L" fixed-wing aircraft. For helicopter transports the Marine Corps is replacing its Piasecki double-rotor "flying bananas" by Sikorsky single-rotor eight-seaters. These in turn are likely to be replaced in three years or so by twenty- to thirty-six-seaters. All this increased demand will certainly lead to higher efficiency in production and lower costs.

The British Army, too, is to benefit from these developments. The eight-seater Sikorsky helicopter is to be built in Britain and should soon be in use in the Army's light liaison squadrons. These squadrons will be on the establishment of the R.A.F., but their pilots will belong to the Army's Glider Pilot Regiment, which is to be kept in being for this purpose, though the British Army will no longer use gliders.

The helicopter is not entirely an unmixed blessing, however. Those who travel by it habitually run the risk of losing their sense of proportion

and of forgetting the difficulties with which the troops below are having to wrestle. It is very necessary that staff officers should make frequent journeys by jeep to restore their sense of realities, and to bring home to them what is happening on the muddy M.S.Rs.—main supply routes—down below.

Already the 27th and 29th Brigades, representing the Commonwealth in Korea, have won lasting fame. It was a fine thing to hear every United States commander, from General MacArthur downward, pay his tribute to them. Now the 27th Brigade has gone—its honours thick upon it—after a very necessary and timely relief by the 28th Brigade. And the 1st Commonwealth Division is forming: at last the Commonwealth detachments in the field will become a balanced force, represented by a general officer of suitable seniority. In consequence, these forces should be assured of a clearer run at any fences that may still lie ahead.

H. G. MARTIN

CHAPTER XXI

PRINCIPAL FOREIGN ARMIES

THE ARMY OF THE UNITED STATES

IN THE United States the higher direction of war is the responsibility of the Joint Chiefs of Staff. They are advisers both to the President, who is also Commander in Chief, and to the Secretary of Defence. The Chairman of the Joint Chiefs keeps the Secretary of Defence informed of their proceedings. The Secretary in turn is responsible to Congress, and also represents the Services on the National Security Council, which co-ordinates military and foreign policy.

When on June 25, 1950, the North Koreans invaded South Korea the United States forces numbered 1,530,000.

The active army had a strength of 596,000 organised in ten divisions at about 70 per cent. of war establishment in men and equipment. Of these ten, one was in Germany, four in Japan, and five—of which one was armoured—in General Reserve in the United States. In addition, there was in Germany the United States Constabulary, equivalent to a reinforced armoured division, and there were garrisons in the Panama Canal Zone, Alaska, the Pacific, and the Caribbean. As for the Marines, of their two divisions, respectively on the eastern and western seaboard of the United States, each had been reduced to three battalions.

Behind the United States Army as described above there stood two other armies, the National Guard and the Reserve. On mobilisation the three are integrated to constitute a single army—the Army of the United States, which is controlled by one General Staff, and in which officers and other ranks are intermingled in accordance with the interests of the Services.

The National Guard is organised and trained very much on the lines of our Territorial Army. It differs from the latter, however, in that—until it is “Federalised” or mobilised—it is a State, as opposed to a Federal, organisation, into which State politics enter very largely. Military efficiency suffers accordingly. The strength of the National Guard—still un-Federalised—was 350,000, organised in 4,861 units, which formed two armoured divisions and twenty-five infantry divisions, at about 50 per cent. of establishment. The Organised Reserve Corps provided on paper three armoured, five airborne, and seventeen infantry divisions, or twenty-five divisions in all, at cadre strength. The Organised Reserve is completely distinct from the National Guard. There is a good deal of jealousy between the two.

The United States rearmament programme gained momentum steadily. On July 19, 1950, Mr. Truman announced his 1,050 m. dollar programme, designed to ensure the orderly expansion of the forces on the assumption that there would be no general war for the next two years. This programme provided for an increase in the army from 596,000 to 1,000,000. One new regular division was to be formed in the United States, bringing the total of regular divisions to eleven. All seven divisions now in Korea—

that is to say, four from Japan and the 2nd and 3rd Infantry and 1st Marine Divisions from the United States—were to be brought up to 100 per cent. of war establishment; all regular army divisions at home to 85 per cent. of war establishment. The 2nd Marine Division at home was to be brought up to full strength. Four National Guard divisions were to be Federalised. This number was later increased to six divisions and two regimental combat teams.

The United States Air Force was to expand from forty-nine to fifty-eight groups by June 30, 1951, the end of the fiscal year 1951.

It was not long, however, before Mr. Truman's plans for orderly expansion were overtaken by world events. The next milestone is Mr. Truman's introduction of his defence budget in January 1951. If various related items of defence expenditure, such as the grant to the Atomic Energy Commission, are included, the total United States defence spending for 1951-52 will amount to 52,000 m. dollars as compared with 26,800 m. dollars in the year 1950-51 and only 17,700 m. dollars in the preceding year. Thus defence expenditure for 1951-52 will take 73 per cent. of the total budget expenditure, or over 18 per cent. of the national income.

This huge sum will suffice to pay for an army of 1,300,000 to 1,500,000 men and women, organised in eighteen divisions, plus twelve regimental combat teams and other units—the equivalent, in all, of about twenty-four divisions. Twelve of these eighteen active divisions will be regular; six will be National Guard already Federalised. The eleventh of these regular divisions has already been formed; the twelfth will be formed during 1951. Two of the twelve will be armoured divisions; two will be airborne; the rest infantry. A thirteenth regular division—armoured—is likely to be formed from the Constabulary in Germany. The President's announced intention is to send four more regular divisions to Germany in the near future, making—with the Constabulary—six in all. There is no present intention to Federalise more of the National Guard. The policy is rather to replace the six National Guard divisions already Federalised by new regular divisions.

The following army and corps headquarters are either already established or in the process of establishment:

First, Second, Third, Fourth, Fifth, and Sixth Armies.	}	in the U.S.
V, VI, and VII Corps		
Seventh Army	}	in Europe.
Eighth Army		
I, IX, and X Corps	}	in Korea; now consists of 5½ U.S. Army divisions and a Marine division.

The United States Marines will expand from 166,000, of whom 77,000 are reservists, to 203,000. One regimental combat team is to be added, to make the strength of the Marines two and one third divisions.

The United States Air Force is to be increased to ninety-five wings; the United States Navy is to commission twenty-five carriers.

The United States Government's plan for providing the men and women required for this programme is termed U.M.S.T.—that is to say, a blend of universal service and universal military training. Under this

plan, as conceived by Secretary of Defence Marshall, all 18-year-olds were to have undergone a four- to six-month period of basic training, followed by a twenty-three-month period of service in their units anywhere in the world. They would then have passed for a further period either of three years in the Organised Reserves or six years in the Inactive Reserves. The executive, however, has been in continual difficulties with Congress over these and other proposals. In consequence, the age of call-up will be postponed from 18 to 18½; a ceiling of 4 m. has been imposed on the strength of the armed forces; and Mr. Truman is likely to have to get the approval of both Senate and House before he can send reinforcements to Europe additional to the four divisions in immediate prospect.

According to tentative organisation tables, the typical field army of the United States will consist in future of three corps, each of four divisions. In each corps there will be one armoured and three infantry divisions. Obviously, however, the existing forces do not conform to this pattern.

The war establishment of a United States armoured division is 15,835 officers and men, with fifty-eight light, 240 medium, and seventy-five heavy tanks. Its tank strength thus compares favourably with the 200 or so medium and thirty to forty heavy tanks of the Soviet tank division. The United States at present uses the medium-heavy Patton tank as its heavy tank.

A series of new tanks is under development: this comprises the T-41 light tank, the T-42 medium tank, and the T-43 heavy. The T-41 is said to be a most successful model, capable of standing up to most medium tanks. It has a speed of over 40 m.p.h. and is under production at the Cadillac plant. The T-42 is believed to be an improved Patton. The T-43 is intended to be the answer to the Joseph Stalin 3. Whether or not it is put into production is likely to depend on how the world situation develops.

An armoured division is organised in two combat teams and a reserve team. Its divisional artillery consists of fifty-four 105-mm. and eighteen 155-mm. howitzers, and sixty light anti-aircraft weapons, all self-propelled but unarmoured. It has no anti-tank or armoured self-propelled guns; the tank itself is regarded as the primary anti-tank weapon. For close anti-tank defence the United States armoured division has 228 bazookas, which will now, presumably, be all of the heavy 3.5-inch type. Its infantry is carried in armoured track vehicles and thus has battle mobility greater than that possessed by the infantry of the Russian or British armoured division, who are carried in wheeled vehicles. It has a reconnaissance battalion equipped with thirty light tanks and twenty-eight armoured reconnaissance vehicles.

The United States infantry division has a strength of about 18,500 officers and men. The infantry division is the basic formation of the Army of the United States; as such it merits full description. It is the smallest unit that is composed of all essential ground arms and services and which can conduct, by its own means, operations of general importance. It can strike effectively, manœuvre readily, and absorb reinforcing units easily. It can act alone or as part of a higher formation.

The infantry division contains three elements—(1) Command, (2) Service, and (3) Combat—as follows:

Command Element :

Divisional Headquarters.
Divisional Headquarters Company.
Reconnaissance Company.
Signal Company.
Military Police Company.

Service Element :

Engineer Combat Battalion.
Medical Battalion.
Ordnance Company.
Quartermaster Company.
Replacement Company.

Combat Element :

Three Infantry Regiments.
Divisional Artillery.
Heavy Tank Battalion.

The Commanding General of an infantry division has a General Staff and a Special Staff to assist him in the exercise of his command. His Chief of Staff is responsible to him for the four branches of the General Staff: G-1 (Personnel), G-2 (Intelligence), G-3 (Operations), G-4 (Administration). For operational convenience divisional headquarters is usually divided into a forward echelon and a rear echelon. The forward echelon consists of the minimum numbers necessary for carrying on tactical operations. The mission of the divisional headquarters company is to establish, maintain, and protect divisional headquarters.

The divisional quartermaster company is used to augment regimental transport for divisional supply and troop movement, for which purpose it has forty-eight 2½-ton cargo trucks. The company also operates the divisional quartermaster office, divisional supply points, salvage point, and the graves registration service.

The reconnaissance company is a command element; it is used for reconnaissance, with counter-reconnaissance and security as secondary roles. The company cannot carry out prolonged operations by itself.

The replacement company was added to the infantry division after World War II. The company receives, and prepares, replacements to join subordinate units of the division. It is capable of handling 200 replacements at a time.

The medical battalion is additional to the medical company within each infantry regiment and the medical detachments found within other elements of the division. It includes a headquarters and headquarters company, an ambulance company, and a clearing company. The battalion evacuates patients from regiments and other elements of the division and holds them until such time as it may evacuate them farther to hospitals in rear areas.

On infantry regimental headquarters there are the following: a heavy tank company (twenty heavy tanks and two medium tanks), a heavy mortar company (twelve 4.2-inch mortars), and medical, service, and headquarters companies. Thus the United States infantry regiment is much more of a self-contained entity than is the British infantry brigade.

The three infantry regiments are the main combat elements of the division. There are three battalions per regiment, each battalion about 900 strong. Each battalion is organised as a headquarters company, a heavy weapons company (four medium machine guns, four 81-mm. mortars, eleven 3·5-inch bazookas, and four 75-mm. recoilless guns), and three rifle companies. Each rifle company is organised as a support platoon (three 57-mm. recoilless guns, three 60-mm. mortars, and three 2·36-inch bazookas), and three rifle platoons each with a light machine gun and a Browning automatic. The personal weapon is the M-1 semi-automatic rifle. The fire power of the battalion is thus very great. So too is the diversity of weapons and ammunition.

The divisional artillery of the infantry division contains fifty-four 105-mm. and eighteen 155-mm. howitzers, and sixty light anti-aircraft weapons (40-mm. and ·5-inch m.g.s.). Of these, only the A.A. automatic weapons battalion is self-propelled. There are no anti-tank guns; here too the tank is the main anti-tank weapon.

The support of the divisional artillery would suffice to overcome no more than light resistance. For normal operations, reinforcing artillery from corps or army would be required. This might take the form of armoured S.P. 105-mm. howitzers or S.P. 155-mm. guns.

The divisional heavy tank battalion is organised as a headquarters and three tank companies, equipped with sixty-three heavy and eight medium and light tanks.

Such, then, in brief is the United States Army. It is supported by a people who number 150 m.; whose wealth and industrial capacity are beyond comparison; whose educational and intelligence standards are high. The army is superbly equipped. Since Hitler's war ended, however, service American officers have voiced their anxiety that discipline had been allowed to slacken, and that training had lost its toughness and realism. Moreover, there is the question of excessive administrative overheads, which is dealt with elsewhere, in the section on the Soviet Army. Suffice it to say here that, according to Defence Secretary Marshall, for every 100,000 soldiers the United States can put only 23,000 in the firing line; whereas Russia puts 80,000 in the firing line out of every 100,000. The Korean campaign, and particularly the later stages under Lieutenant-General Matthew Ridgway, have come as a salutary awakening.

THE FRENCH ARMY

During the last year there have been three outstanding events in France's military renaissance. The first took place on August 7, 1950, when the French Government published a memorandum on its proposals for expanding the armed forces which it had just sent to the United States State Department. At an additional cost of 2,000 m. pounds the French Government proposes to raise fifteen new divisions in the course of the next three years, making a total of twenty divisions in all. Ten of these divisions, we learnt subsequently, are to be ready in 1951; fifteen in 1952; all twenty by 1953.

At that time the strength of the French armed forces was 659,000 men. Of this figure, the Army accounted for 477,000, the Air Force for 67,000, the Navy for 54,000, the Gendarmerie for 60,000. France's metropolitan,

army already consisted ostensibly of two armoured divisions, eight infantry divisions, one mountain division, and an airborne division; but of these twelve divisions only five—the two armoured divisions and three of the infantry divisions—were actually more or less in being. Three of these five divisions are stationed in the French zone of Germany. Apart from these five metropolitan divisions, there are two divisions in North Africa. In addition, there are 170,000 troops in Indo-China, of whom 50,000 are soldiers from metropolitan France.

The second outstanding event took place on September 2, 1950, when M. Plevin announced that he would ask Parliament to approve the extension of conscript service from one year to eighteen months. This step—together, presumably, with increased recruiting—is to raise the strength of the French armed forces from 660,000 to 763,000 in 1951 and ultimately to 900,000 men, and so to provide the additional fifteen divisions. There are to be no exemptions; so each annual class will number about 240,000, of whom the Army will take close on 200,000. Thus the Army gets a windfall of about 100,000 trained conscripts. None the less, it is difficult to see, on this showing, where the 240,000 men are to come from who are needed to raise the strength of the armed forces to 900,000 and to produce fifteen new divisions. We are driven to the conclusion that the extension of conscription to eighteen months can be merely an interim measure; and that, as soon as the supply of arms is adequate, the term of conscript service will be extended once more, this time to two years.

The third outstanding event was the National Assembly's acceptance of 740,000 m. francs for military expenditure in the French budget for 1951. France's military expenditure thus rises to 29 per cent. of the total estimates in 1951 as compared with 19 per cent. in 1950.

That the French Army should grow strong once more is a vital need not of France alone but of all members of the Atlantic Union. Thus restored, that Army would be the most effective means to fill the military vacuum that now exists in Western Europe to our common peril. Besides being as poor as the rest of us, however, post-war France has been bitterly divided on the question of rearmament. So the Army has had to subsist hitherto on a far too meagre budget. And all the time its strength has been drained by that running sore, Indo-China. West and East—the two problems indeed are one. The rebellion in Indo-China is a perfect example of the Politbureau's world strategy at work.

On this Far Eastern-cum-South-East Asian sector of a world front, the French in Indo-China were in the forefront of the battle long before the Communists invaded South Korea. During the past three years they have had 120,000 to 170,000 troops engaged, and by the end of 1950 these had lost 19,000 killed, seriously wounded, or missing. The annual loss of officers in Indo-China is equal to the annual output of officers from the Cadet College at Couetquidan. The campaign has cost France £800 m.

What the French are waging, particularly in Tonking, is a major war against a strong, well-trained, and well-equipped army: an army, moreover, which is now in direct physical contact with Communist China. In this overseas commitment eighteen-month conscripts play no part; France's long-service volunteers have to bear the whole burden. Coloured troops and the Foreign Legion do their share, but the bulk of the task must fall to Frenchmen.

Of what this task means the following facts will give some indication. Volunteers sign on for three years. As soon as they have completed four months' basic training, off they must go overseas, generally to Indo-China. Theirs is nominally a two-year tour overseas, but it usually works out at two-and-a-half. Thus when the volunteers get home they are about ripe for discharge; unless, indeed, they elect to extend their service, in which case they will be due to go overseas again within another year. Such is the prospect before the volunteers. Understandably, voluntary recruiting suffers; and the proportion of long-service volunteers who are left to serve at home is far too low. The shortage of technicians is particularly acute.

This absence of old soldiers of all sorts adversely affects the metropolitan Army as a whole. The metropolitan Army—other than that portion of it which is recruited in North Africa—is, of course, a conscript army. Unlike our National Service registration and call-up, both of which are handled by the Ministry of Labour, conscription in France is the concern of the Statistical and Recruitment Department of the Army. Military claims have an absolute priority over those of industry. The conscripts or *appelés* are called up twice in the year only, in spring and autumn.

Conscripts now do eighteen months' Colour service in all. Their first six months they spend as *bleus* or recruits in the Light Camps, which are adjuncts of all units or groups of units of the metropolitan army. The underlying object of these Light Camps is to get the young soldiers out of towns and into hotted camps in the country. The conception was originally Marshal Lyautey's sixty years ago. General de Latre de Tassigny introduced the scheme after the late war. The open-air lives led by the *bleus* in their Light Camps are very similar to those led by our own National Service men at their Arms Basic Training Units. Training is intense; enthusiasm is still at its peak.

In the course of these first six months there are certain milestones. After two months potential officers and N.C.Os. go off to the *École de Cadres* at St. Maixent or Strasbourg or in Germany, where they remain till the end of their sixth month. Those left behind in the Light Camps devote their first four months to basic training. Volunteers or *engagés* also do four months' basic training at the Light Camps of their regiments. After these four months they are drafted overseas, generally to Indo-China. Conscripts pass on during their fifth and sixth months in the Light Camps to specialist training, as signallers, drivers, or infantry tradesmen or as junior N.C.Os.

At the end of six months the conscripts cease to be *bleus* and become *anciens*. At the same time they leave the Light Camps to join the duty companies or squadrons of their regiments in barracks. There they should—but seldom do—find themselves integrated with a due proportion, say one in three, of long-service volunteers. It is these companies or squadrons that constitute the field army of France at peace establishment. This change of status may take the ex-*bleus* only across the road or may mean a complete change of scene. Simultaneously, new batches of *bleus* fill the places they have vacated in the Light Camps.

By now the potential officers and N.C.Os. who have spent four months at the *Écoles de Cadres* have also completed their first six months. Those

of them who have passed the examination test required of officers—and their number may amount to 5 per cent. of the intake—now go on as reserve officer pupils to the *Écoles d'Application*, or Specialist Schools, of their arms. Subsequently they are attached to field units as *aspirants*, and at the close of their eighteen months' service they become Officers of the Reserve. On the other hand, those who have failed to make officer grade at the end of six months return to their Light Camps as full corporals to help to instruct the new batches of *bleus*.

At the end of eighteen months all conscripts, whatever their status, revert to civil life. For another year, however, they are all held in what is called the *Disponibilité*; that is, they are still part of the Army and are liable to recall at the discretion of the military authorities, who are thus enabled in case of need to bring the duty companies or squadrons of the field army up to war establishment at short notice. After the year in the *Disponibilité*, the ex-conscripts pass into the First Reserve for a period of years; whence they will pass on successively for further periods in lower category Reserves. The Reserves are liable to recall only by decree of the Council of Ministers.

The question is often asked: Does the conscript fulfil as an *ancien* and a reservist the bright promise of his first six months as a *bleu*? It is doubtful. The answer depends on whether or not the *ancien's* collective training in barracks can be made as real and interesting as was his individual training in his light camp as a *bleu*. When the *ancien* arrives in the barracks where he will spend his last twelve months he seldom finds enough long-service N.C.Os. and men to initiate him into regimental life: too many of these old soldiers are now needed overseas. The heaven is not there. The *ancien's* time is taken up largely with guard mounting and similar routine. Hitherto equipment has been all too scanty. So the ex-conscript is apt to return to civil life with enthusiasm damped. During his year in the *Disponibilité* he does no further training. By the time he reaches the First Reserve he is getting rusty. If he is not to forget all the lessons of the Light Camps he should now begin his reservist training.

Unfortunately, the funds voted for Reserve training in the past have been too small to give the requisite number of officers and men the periodical field training they need. Thus an annual back-log of trained reservists has been piling up, who are in danger of forgetting all they ever knew of soldiering.

Such, then, in brief, is the French military machine. In theory, the Army—given the necessary arms and equipment—should be able to triplicate itself on mobilisation. Thus the *Disponibilité* should bring existing units of the First Line up to war establishment immediately, and should enable each unit to throw off a *noyau actif*, or kernel, amounting to about one-third of its strength. And the First Reserve, arriving on the heels of the *Disponibilité*, should expand each kernel into a Second Line unit. Indeed, the Second Line should be ready almost as soon as the First. Similarly, the Second Line should throw off its *noyaux actifs*—though on a descending scale—and these *noyaux* should be expanded into Third Line units by the Second Reserve. The fact that six annual classes went untrained during the war still affects the working of this scheme.

Many hold the view, however, that the machine will never work smoothly

until conscript service has been increased to two years, in line with our National Service here at home. The two-year conscript could serve in Indo-China and thus release much-needed volunteers. No doubt both Socialists and Communists in France would oppose any such increase bitterly. Frenchmen of 1951, however, might well recall how their fathers of 1913 raised the term of conscript service to three years in a time of national peril.

For the rest, it will be necessary to ensure three things:

- (1) that First line units of the metropolitan army shall contain enough long-service volunteers to leaven the conscript mass;
- (2) that Reservists shall receive enough retraining to keep them reasonably efficient; and
- (3) that fighting equipment enough to outfit the army on mobilisation shall be held ready in mobilisation reserve.

As yet the demands of Indo-China defeat the first object; shortage of funds have defeated the second; the heterogenous armament of the French Army—the legacy of the war—has defeated the third.

In regard to rearmament in particular, France herself has now produced a series of promising prototypes, among them a 13½-ton light tank, a 50-ton heavy tank, an armoured reconnaissance vehicle, a bazooka, a heavy mortar, and a recoilless gun. It must be remembered, however, that these are still prototypes, which have still to be subjected to exhaustive trials before French industry can be tooled up to make them. National pride urges the adoption of national weapons. It is questionable, however, how far the policy is wise when there are already well-tried and standardised patterns of similar weapons available from allied sources.

THE SOVIET ARMY

In the late war the Red Army was a mass-produced army. Because of the almost total destruction of its forward elements in the opening phases of the war, it had to pour infantry reinforcements on to the battlefield when these were still only half trained. Moreover, it used these half-trained masses with complete disregard of human life. Thus few Russian infantrymen survived long enough to become trained soldiers. It was this fact, coupled with normal Communist reluctance to allow initiative to subordinates, that conduced to the Soviet practice of attacking in columns of divisions on narrow fronts—a practice that facilitated rigid control.

In its offensives throughout the war it was the Soviet Army's almost invariable strategy to attempt double-envelopment. This was a strategy, however, that was successful only when the Soviet Army could reckon on a superiority in numbers of at least four to one, supported by a corresponding superiority in artillery and armour. Moreover, the Soviet Army took months in which to prepare each major offensive. Given time, however, it could rely on the immense output of Soviet industry, together with Lease-lend, to provide it with almost unlimited supplies of equipment and ammunition.

Since the war the Soviet Army has been thoroughly reorganised and trained. No doubt, therefore, it is a greatly improved weapon. Its

chiefs are men of proven ability. Marshal Vasilevski, for instance, who is now head of the Ministry of the Armed Forces, was responsible for planning the Stalingrad counter-offensive. Later he was Stalin's deputy and commander of an army group. Later still he held the Far East Command and overran Manchuria. Under the Soviet system of command Vasilevski is responsible for the Army and Air Force; there is now a separate Ministry of the Navy. Marshal Sokolovsky, formerly in Berlin, is now Vasilevski's deputy. Koniev, whose army group swept across Czechoslovakia to Vienna, is Chief of the Land Forces. Rokossovsky, conqueror of East Prussia, is Minister of Defence for Poland. The Soviet Army, however, is still a mass-produced army, formidable primarily because of its vast size. The Russian soldier still lacks the ability to handle and maintain complicated equipment.

The Soviet Army is the world's largest conscript army; it is estimated to have 2,800,000 men now under arms. Since the war it has conscripted about 1 m. men a year. Conscripts do two years' Colour service followed by Reserve service. It is probably correct to say that at any moment the Soviet Army could call on 12 m. or more trained men.

The Soviet Army works its conscripts much harder than do the Armies of the West. Units are composed of men drawn from all over the Union, and these men rarely find themselves serving near their own homes. Whatever their origin, Russian conscripts possess great physical endurance, and are accustomed to live rough. The training programme is extremely severe. Many of the conscripts—and particularly those from some of the outlying nationalities of the Union—lack education and intelligence.

Those of the conscripts who shape best, and who show themselves also politically reliable, are re-enlisted as regular soldiers on the permanent Staff. After attending courses at N.C.Os. schools, those thus selected can hope for promotion accompanied by substantial rises in pay. The Soviet Army has no difficulty in enlisting from among its conscripts all the long-service volunteers it needs. The Army as a career offers advantages in the shape of clothing, food, housing which the conscript could never hope for in civil life. Above all, the Russian soldier enjoys the respect of the Party, together with the high morale which comes of strict discipline and thorough training. Service in the Soviet Army confers prestige.

It is an army ruled by an iron discipline enjoined by Stalin himself. Discipline thus understood amounts to the religious observance of every minutest order or regulation. A superior is forbidden to overlook in a subordinate any shortcoming whatsoever. Other ranks must salute not only officers but also N.C.Os., and with a frequency and zeal undreamt of in Western Armies. Punishments for military offences are extremely severe—the more so since to the official punishment is added the weight of public censure, always officially directed upon those who "let down the side."

Over this blended mass of conscripts and regulars presides the officers' corps, holding itself rigidly aloof. It is Soviet policy to use every means to raise the status of the corps. From the vast number of officers who served in the late war the Soviet Army has now weeded out all but the more efficient. To those it has thus retained it has given no choice as to whether or not they would make the Army their career.

Promotion in the corps is by selection. The factor which weighs most with the selectors is political reliability, though they consider also war records and educational qualifications. Pay and privileges increase rapidly with each rise in rank. Thus, while the pay of a General in the Army in the United States Forces is to the pay of a private in the ratio of about 15 to 1, the pay of a Marshal in the Soviet Army is to the pay of a private in the ratio of no less than 114 to 1.

The Soviet Army employs so many officers that it can afford to be lavish in their training. Thus, where officers of Western Armies may be absent, say, for a year at their staff college or similar training establishment, Russian officers go on courses of two or three years' duration.

The main weakness of the officer corps is reluctance to accept responsibility. This weakness, which is inherent in the Russian character, is accentuated by Party discipline, which demands the most meticulous obedience. Thus the officers' corps must learn to be proficient in the art of what readers of Orwell's *Nineteen-eighty-four* will recognise as "double-think." In the military field the corps must be capable of initiative, yet it must remain blindly subservient in the political; professionally it must be honest and open-minded, yet politically dishonest and dogmatic.

In all this mental conditioning the kommissars, or Political Officers as they are now called, play a leading part. Ranking as "Deputy Commanders for Political Affairs," these Political Officers appear in every echelon of command above the company. They are responsible for the political education of the troops, and serve ostensibly under the command of their respective commanders. At the same time, however, they communicate, through separate channels of their own, with their own political superiors and inferiors, and are charged with the reporting of every instance of suspected disloyalty or neglect of duty. Below battalion level they rely on Party members in the ranks to keep them informed. In such conditions commanding officers can hardly feel secure.

Behind the kommissars and controlled by the Politbureau stand the Secret Police, who include a uniformed and military force of 450,000 men. To the Secret Police all men—even the most renowned of Marshals of the Red Army—are vulnerable.

On its present peace establishment the Soviet Army contains about 175 divisions. Of these some—and notably the divisions on Occupation duties in Eastern Europe—are up to strength at 10,000 to 13,000 men; others are only in cadre form. Soviet divisions on Occupation duties, according to a recent and reliable estimate, are as follows (the proportion of armoured and mechanised divisions is here quite abnormally high):

Germany:	8 armoured, 10 mechanised, 4 rifle, 2 artillery, 8 A.A.
Poland:	2 armoured, 2 mechanised.
Austria:	1 mechanised, 1 rifle, 1 A.A.
Hungary:	2 mechanised.
Rumania:	2 mechanised, 1 A.A.

In addition there are about 10,000 Soviet troops in Finland, and detachments in Czechoslovakia, Bulgaria, and Albania.

Within two months of the outbreak of war the Soviet Army could probably mobilise about 300 divisions; at the peak of its effort in the late

war its total of divisions amounted to about 600. The Soviet Army achieves this multiplicity of divisions by a process of streamlining rigorously applied. Marshal Vasilevski believes that it is the men in the firing line who win battles. He sees to it, therefore, that in the Soviet Army there shall be as many men as possible in the firing line—at the expense of the rearward services—and that the ratio of weapons to men shall be higher than in Western armies. He has begun right down at rifle company level. Whereas in a rifle company in the United States Army there are thirty-seven men whose primary jobs are cooking, signalling, M.T. driving, or clerking, in a Soviet rifle company all but two are there for one purpose only—to shoot at the enemy.

Marshal Vasilevski has continued the process right back through the division itself, and through successively what the Americans call the “combat zone,” the “zone of communications,” and the “zone of the interior”—this last being Soviet Russia itself—till he reaches the Ministry of the Armed Forces itself. The consequences are striking. Here are some of them.

Though Soviet divisions are much weaker in numbers than are their Western counterparts, they are little if at all weaker in fire power—indeed, in some respects they are stronger. Thus a Soviet rifle division 10,800 strong will put nearly 5,000 men into the firing line; while a United States infantry division 18,800 strong will put 7,600 into the firing line. Yet the weight of fire of these 5,000 Russian riflemen will be 14 per cent. greater than that of the 7,600 Americans.

True, the United States division will be stronger in artillery and armour. As to that, Marshal Vasilevski prefers to keep the bulk of the Soviet artillery and armour concentrated in specialised formations, which he can use with overwhelming force where and when he wants them.

We see another consequence of Vasilevski's Spartan organisation when we come to compare the Russian with the U.S. “divisional slice.” The divisional slice is the number of men, from War Office to fox-hole, who go to maintain a division in the field. Marshal Vasilevski has to allow only some 22,000 men per Soviet division; whereas General Lawton Collins has to allow no less than 60,000 to 70,000 per United States division. Thus Marshal Vasilevski could mobilise his 300 divisions on a 6,600,000 men budget. For the same manpower budget, however, General Collins would get no more than 100 divisions—and each of these, in consequence, might expect to have to hold three times the frontage of its Soviet opposite number.

Clearly, the West has something here to learn from Marshal Vasilevski's methods. Russia, with its plethora of cheap manpower, has given us, with our manpower shortage, a striking lesson in economy of administrative overheads. Clerical staffs, cooks, orderlies, M.T. drivers, signals, engineering and medical services—Marshal Vasilevski prunes the lot ruthlessly.

Of course, his is a comparatively simple problem. He can afford to cut overheads because he is dealing with men accustomed to conditions that more civilised Westerners would find intolerable. For instance, in the Soviet Army there is no personal documentation of soldiers below the rank of major; the medical battalion of a division is only eighty strong.

Moreover, Vasilevski is faced by the fact that in Russia there is no educated class of minor technicians. Thus with the best will in the world he could not have provided the Soviet artillery with the men to do the

survey, work out the computations, and man the observation posts on a western scale. Perforce, he must there cut overheads at the sacrifice of some flexibility of fire of his artillery.

Finally, he has a comparatively small zone of communications to deal with. If war should come the Soviet Army would advance from its bases in Occupied Eastern Europe in an attempt to overrun the western fringe. Throughout, Vasilevski would be fighting almost on his own doorstep; but not so the United States or even the British armies—theirs would be an overseas campaign, fought through a zone of communications that must add greatly to the magnitude of the divisional slice. None the less, when we have made all these allowances we still are left with our lesson to learn. The West cannot afford to put so few of its soldiers into battle.

The armour and artillery of the Soviet Army are generally accepted to be its most important arms. Both of these it handles on the pool system: that is, it holds vast reserves which it can use to reinforce decisive sectors of the front. The standard Soviet medium tank is the T-34, mounting an 85-mm. gun. Though the T-34 has been in service since 1941, it is still a useful medium tank. The heavy tank is the Joseph Stalin 3, mounting a 122-mm. gun. This is a powerful tank with a low silhouette, but it has little reserve of horsepower, and it carries only twenty-eight rounds for its 122-mm. gun, whose rate of fire is low. Soviet tanks are mechanically reliable, but their finish is poor, as is their maintenance in the field. The tank output of Soviet industry, and the accumulated reserves are very large. Another notable weapon in Soviet armoured divisions is the heavy 152-mm. S.P. gun-howitzer.

There are two types of armoured division in the Soviet Army—the tank division and the mechanised division. The tank division is designed primarily for short-range work in co-operation with infantry. Its strength lies mainly in tanks, supplemented by mortars and infantry. Its basic units are the following: three medium tank regiments, totalling about 200 T-34 tanks, one mixed heavy tank regiment of about fifty Joseph Stalin 3 tanks and twenty-five 152-mm. S.P. gun-howitzers, and a motorised rifle regiment of three battalions. The tank division has a strength of about 10,500 men.

The mechanised division is designed for more independent action; it has fewer tanks and more guns and infantry. Its basic units are the following: three motorised regiments each of two battalions, one mixed heavy armoured regiment of about fifty 152-mm. S.P. gun-howitzers and twenty-five Joseph Stalin 3 tanks, one medium tank regiment, one 122-mm. howitzer regiment, and rocket, anti-aircraft, and reconnaissance battalions. Its strength is about 13,000 men.

A mechanised army would consist of a suitable combination of mechanised, tank, and rifle divisions, perhaps five or six in all.

The artillery constitutes nearly forty per cent. of the Soviet Army's strength. Generalissimo Stalin has called the artillery "the god of war." In the final assault on Berlin the Red Army is said to have deployed 22,000 pieces—that is, more than twice as much artillery as the Western Allies deployed in North-West Europe. As we know it to-day, the Soviet artillery is the creation of Marshal Voronov, who is still at its head. Soviet ordnance generally is highly efficient.

Voronov has organised the artillery in part as divisional artillery, which

is generally on a smaller scale than that of the divisional artillery of Western armies, and, for the rest, as a vast artillery reserve, some of which is at the disposal of armies and the balance in army group or G.H.Q. reserve.

This reserve artillery is organised in artillery divisions and even artillery corps. The artillery division has a variable composition. Normally its strength is about 10,000 men, and it includes regiments of 76-mm. guns, 122-mm. howitzers, 152-mm. howitzers, and 122-mm. guns: perhaps 150 pieces in all. Alternatively, artillery divisions may sometimes consist entirely of medium and heavy artillery, or else of anti-aircraft artillery. Whatever their precise composition, they perform, though on a larger scale, the same role as do Army Groups, Royal Artillery, in the British Army: that is, they are used as reinforcements wherever large artillery concentrations are required.

In the Soviet artillery, radio and radar are provided on a comparatively low scale. Thus Soviet methods of fire control are not as technically advanced as those of Western armies. This fact explains the Soviet predilection for short-range weapons adapted for area shoots, such as heavy mortars and rocket launchers, and for light 76-mm. guns which it uses very often for direct fire. All these equipments can be deployed in the forward area and demand a minimum of control.

When the Soviet artillery is given the time and information it needs for the preparation of a deliberate programme, whether in attack or defence, it can produce an annihilating weight of fire. To frustrate Soviet reconnaissance, therefore, and to perfect concealment and camouflage would be very necessary precautions. In order to simplify problems of control and support in a moving battle, it is the Russian practice to decentralise the command of a large portion of the artillery at an early stage. Artillery thus decentralised loses its power to concentrate its fire.

There are two types of infantry division in the Soviet Army—the “new model” and the “old model” rifle division. Both are post-war creations, and they are identical except for the fact that whereas the transport of the new model division is wholly mechanised, of the old model the artillery and the reconnaissance battalion are still horsed. Both are about 11,000 strong.

In the rifle division there are the following basic units: the divisional armoured regiment consisting of about fifty-five T-34 tanks and twenty S.P. 100-mm. guns; divisional artillery armed with 76-mm. guns, 122-mm. howitzers, and 120-mm. mortars, about seventy-two pieces in all; and three rifle regiments, each of three battalions. A support unit in each rifle regiment contains six S.P. 76-mm. guns, and also 120-mm. howitzers and 57-mm. A.T. guns. In each rifle battalion there are three rifle companies, and two heavy weapon companies armed with medium machine guns and 82-mm. mortars. Unless troop-carrying transport has been specially provided, rifle companies march on foot.

Divisional troops also include the usual signals, engineers, and medical and administrative services, but all on a scale much smaller than in Western divisions.

A rifle corps would consist normally of the following: two or three rifle divisions; a tank or mechanised division; and a small component of corps medium artillery. A rifle army would consist of two or more

rifle corps, with a very large artillery component which might take the form of an artillery division.

Throughout the war the Soviet Army made extensive use of horse cavalry, and undoubtedly would do so again in any future war. Horse cavalry was used for almost every sort of mission other than the attack or defence of fortified positions. It was particularly adapted to use on ground unsuited to other arms, and for missions against open flanks or behind the enemy's lines. Its success, however, was dependent on its use *en masse*—in formations, that is, as large as a corps.

A cavalry division is estimated to have a strength of about 5,000 men, and to consist of three cavalry regiments and a small horse-drawn divisional artillery component. A cavalry corps would normally consist of three such cavalry divisions, together with corps troops which would include one or two regiments of medium tanks, and S.P., anti-tank and anti-aircraft artillery.

As early as 1930 the U.S.S.R. had begun to train parachute troops, and it is believed to have entered the war with about fifteen well-trained parachute brigades. After the German offensive had begun, however, the Soviet High Command found no opportunity to use these brigades in their proper role; instead, it had perforce to sacrifice them in the infantry battle, in an endeavour to stay the enemy onrush. Asher Lee writes in his book *The Soviet Air Force*: "In the space of less than three fateful summer months the better part of ten years of intensive preparation and specialised training was virtually reduced to nought." Subsequently the Red Army re-created its airborne forces, but hardly ever used them—and never with success. To quote Asher Lee again: "The fact is that in face of strong opposition large scale parachute operations are hazardous and expensive. . . . It was gloriously immoderate to train, equip, and organise nearly 100,000 skymen three times between 1938 and 1945, and thrice to put them back into battle with the infantry. But it was also proof of Russian flexibility."

To-day the Soviet continues to train airborne troops and to build transport aircraft. In the light of past events, however, we may surmise that the High Command is thinking in terms of air transportation as a means of rapid reinforcement rather than of airborne offensives behind an enemy front.

Thanks mainly to the help of German technicians and the capture of German material, the Soviet Air Force—which is part of the Army—has made immense progress since the war ended. Russian aircraft production is reckoned to be running at at least 12,000 military aircraft annually, and it is generally estimated that the Soviet Air Force to-day has a first line air strength of 19,000 military aircraft.

Soviet military aviation is now divided into three parts. First, there is the army or tactical air force, consisting of about 7,500 aircraft, mostly fighters and light bombers. Secondly, there is a similar number of air defence fighters or interceptors. Moreover, the back-bone of these first two categories consists of high-performance, jet-propelled fighters and fighter-bombers which are being turned out at the rate of 2,000 a year. Thirdly, there is the strategic bomber group or long-range air force, consisting of about 500 Tu-4's (the Soviet version of the B-29), supplemented by several hundred old four-engined bombers.

The highest Soviet air formation is the air army. An air army is composed of a number of air divisions and is of variable strength dependent on the situation. On occasions in the late war, when very large air concentrations of several thousand aircraft were made, a number of air corps headquarters were interpolated between air army headquarters and air divisions. On such occasions over 10,000 daily sorties were often made in support of one army group. An air division usually contains three air regiments; an air regiment usually contains three squadrons at thirty to fifty aircraft each. Thus the strength of a division is from 270 to 450 aircraft.

The Soviet High Command does not observe the Anglo-American principle of centralised control of air power. In the Soviet organisations there is an air army under command of each land army group. Indeed, the command of air divisions is often decentralised further to army corps or even armoured divisions when these are operating in independent roles.

Such in brief is Soviet military aviation to-day. Mere numbers are no true gauge of its strength, since it lacks both the firm basis of experience and many of the operational aids that make for the efficiency of the Anglo-American Air Forces. Yet Western Armies, with their memories of complete air superiority enjoyed during the closing years of the late war, would find conditions at the outset of another war very different. As Asher Lee remarks, "In Moscow they know that if the Soviet Air Force is rough, it is ready."

From the Soviet Air Force we pass naturally to the atomic bomb. It is generally accepted that inferiority in atomic weapons is Russia's main weakness, and the main factor deterring her from war. There is no doubt that the United States has both a qualitative and quantitative lead in the atomic field, and that the United States strategic air force can make that lead effective. The atomic bomb, however, is less a war winner than a deterrent from war. If it is to remain a deterrent, the President of the United States must retain an unfettered discretion to use it to meet aggression of any and every nature.

Apart from the Soviet Army proper, there are the Armies of the Eastern European satellites. These satellite Armies have been increasing greatly in response to N.A.T.O.'s rearmament drive. Strongest of these armies is the Polish, under the direct supervision of Marshal Rokossovsky. already it is estimated to number 520,000, backed by trained reserves which will soon number 600,000. In addition, 320,000 18 to 19 year-olds have received training in the "Service of Poland" youth movement.

This Polish army is organised in some nineteen Soviet-type divisions, of which two armoured divisions and eight to ten rifle and motorised divisions are reported to be ready for combat.

Bulgaria, Hungary, and Rumania, according to Yugoslav estimates, have created armed forces totalling about 600,000. Czechoslovakia has five or six divisions ready. The People's Police of Eastern Germany number about 170,000. All these forces will be armed with standardised Soviet weapons.

In the event of war to-day the reliability of these armies—and particularly of the Polish army—would be highly questionable. With their hopes of freedom rekindled, the Poles would be likely to take every opportunity to desert to the West. As years pass, however, the temper will

change. By mass deportations and the indoctrination of youth, the Soviet authorities will remorselessly eradicate all memory of freedom.

No description of the U.S.S.R.'s military potential would be complete without a reference to partisan warfare. Radio, aircraft, parachutes, light weapons of great fire power—all these have vastly increased the potentiality of Fifth Columns. On the Eastern front throughout the war partisans waged underground warfare on a scale unprecedented. The direction of this underground war was all the more effective since the Party controlled both the Red Army and the partisan leaders. In any future war the Party will be ubiquitous. The forces of the Western nations, therefore, will have to reckon—whether in their own territories or in those of the enemy—with ruthless and powerful partisan forces, cunningly directed. As General de Lattre de Tassigny warned a large body of officers recently, nowhere will be secure: always headquarters must be located in reserve formation areas; formations must be organised for all-round defence; every man as he goes about his duties must be constantly on the alert, far behind the lines no less than at the front.

The Soviet Army would be an extremely formidable antagonist. A weak point, however, might well be the rigidity of its commanders' plans. They do not like to give initiative to their subordinates. And they are mortally afraid of the consequences of failure. For the rest, just how formidable the Soviet Army would prove would depend largely on how far Russia's many peoples were united behind the Politbureau, and how successfully the Western nations could create and exploit disunity.

THE CHINESE ARMY

Mao Tse-tung and Chu Teh—these two are the architects of the Chinese "People's Liberation Army" of to-day. Mao, who is 58, is the child of a well-to-do peasant family of Hunan. At the time of the foundation of the Chinese Communist Party, in 1921, he was library assistant in the National University of Peking. Acting on instructions from the Comintern, the Party at that time subordinated itself to Chiang Kai-shek and the Kuomintang in the struggle against the northern War Lords. In April 1927, however, Chiang himself turned against the Communists, suppressing them ruthlessly in Shanghai and other cities. Thereupon Mao, who had been busy organising peasant revolts in his native Hunan, transferred his attentions to the rich province of Kiangsi, to the northward of Canton, where he set up a "Soviet republic."

It was here in Kiangsi that Chu Teh threw in his lot with Mao Tse-tung. Chu Teh, who is 64, is the son of a wealthy landowner of Yunnan. He started life as an officer, but by 1922, at the age of 35, had also held important civil appointments in the Yunnan provincial administration. It was at this stage in his career that Chu Teh broke with the past. Joining successively the Kuomintang and the Communist Party, he went to Germany and France for four years to study the art of war, and returned to take up a command under Chiang Kai-shek. Thus it was that he found himself in command of Chiang's troops in Kiangsi in 1927. That was his opportunity to revolt and join forces with Mao. Already urban Communism in China was dying fast. Henceforth Mao set himself to organise rural Communism, with Chu Teh as its Commander-in-Chief.

Chiang realised the danger that threatened the Kuomintang from Kiangsi, and set himself to reduce this Communist stronghold. He found Kiangsi a hard nut to crack. It was not till 1934 that he had the Communists cornered. It was then that Mao decided upon the Long March: that is to say, upon a Chinese version of the Great Trek. In October 1934 he set out from Kiangsi at the head of his army and his people. Over a year later his march ended in Yen-an in the far north-west. During this exodus the Communists had covered about 4,000 miles. Here, in the bleak hills of Shensi, Mao set about organising his ideal Communist state.

In autumn 1937 Mao and Chu Teh again found themselves fighting on the side of Chiang Kai-shek—this time against the Japanese. Again Mao was obeying the orders of the Comintern. He did not disguise the fact, however, that the Army of the Long March, now 300,000 strong applied nine-tenths of its effort against the Kuomintang and only the remaining one-tenth against the Japanese.

On the mainland of China the war against the Japanese continued without decisive results until, immediately before V.J. Day, Russia occupied Manchuria. This event was to prove the turning point in the fortunes of Mao and his Army of the Long March—soon to be renamed the People's Liberation Army. Within a year the Russians handed Manchuria over to Mao. Thus, at one stroke the Liberation Army had acquired vast stocks of Japanese arms and a secure base of operations in direct touch with the Soviet Command in Eastern Siberia.

From this point Mao took only fourteen months to conquer all China. On October 1, 1949, he set up his capital in Peking. By the beginning of 1950 he was master of nearly all of China's 450 m. people; Chu Teh's Liberation Army, constantly swollen by defections from the Nationalists and by the adherence of guerrilla bands, already numbered 2½ m. men.

Such rapid expansion meant that the Army was never more than half Communist in composition. As Chu Teh, a rigid disciplinarian, was well aware, dilution on such a scale might have been extremely dangerous. He handled the situation skilfully. When Nationalist levies transferred their allegiance *en masse*, it was his practice to summon the Nationalist officers to headquarters for reindoctrination. In this way he separated them from their men. His next step was to use all the wiles of propaganda to discredit the Nationalist officers in their troops' eyes. Thus, when the time came for them to return to regimental duties, the Nationalist officers found themselves so unpopular that they preferred to quit the Service rather than face their men—and Chu Teh was then free to replace them by his own nominees.

So much for the defeat of Nationalist China. We come next to the Korean campaign. Late in October 1950—that is to say, only a year after he had set up his capital in Peking—Mao, as Chairman of the Military Affairs Bureau, authorised Chu Teh, his Deputy Chairman and Commander-in-Chief, to send the Liberation Army across the Yalu and into Korea. Red China had attacked the United Nations.

At the time of its intervention in Korea the Liberation Army was organised in four "field armies"—we should call them army groups—and a North China Military Command. Centred on Tihwa or Urumchi in the far north-west is the 1st Field Army under General Peng Teh-huei,

Deputy Commander-in-Chief. It is this field army that is responsible for the Tibetan campaign. Centred on Chungking in the south-west is the 2nd Field Army under General Liu Po-cheng, a veteran of the Long March. This is the field army that stands on the Indo-Chinese and Hong Kong frontiers.

Centred on Shanghai and extending along the east Chinese coast opposite Formosa is the 3rd Field Army, 450,000 to 600,000 strong, under General Chen Yi. This is the field army that would be responsible for the invasion of Formosa, and elements of it have been engaged in Korea. Finally, centred on Harbin in Manchuria there is the 4th Field Army, perhaps 700,000 strong, under General Lin Piao, another veteran of the Long March. This field army—the strongest of them all, and the best trained and equipped—returned to Manchuria from the south during the late summer and autumn of 1950. It bears the primary responsibility for the Korean campaign, but by no means all of it has yet reached Korea.

There is also the Manchurian or North China Command, normally under General Kao Kang. And there is a joint Soviet-Chinese Headquarters at Changchun in Manchuria.

Last October the Liberation Army, thus organised, was reckoned still to number about $2\frac{1}{2}$ m., and it was backed by 5 m. or more local militiamen and provincial levies. Subsequently there have been reports of large increases. For instance, it has been reported that another field army—the 6th—has been formed on the South China coast, under General Yeh Chien-ying, to fill the gap created by the removal of the 4th Field Army to Manchuria. It has been reported also that Mao has agreed to expand the Liberation Army to $4\frac{1}{2}$ m. men, to be organised on Soviet lines, on the understanding that Russia would supply the equipment. These reports still await confirmation.

The manpower problem involved in these increases would be easy enough to solve; the armaments problem might be more difficult. China herself produces only negligible quantities of ingot steel and oil; and, though the Soviet block as a whole may produce up to 30 m. tons of ingot steel, the greater part of which is converted into armaments, there are many other claimants to these arms already in the queue ahead of Mao's $4\frac{1}{2}$ m. Chinese.

Meanwhile the Liberation Army remains largely a primitive army in the age-old Chinese tradition. The *ping* or soldier often arms himself with both rifle and umbrella. His guns are often archaic, wooden-wheeled Japanese 40-mm. cannons. His home-made mortars go forth to war on the back of country-bred ponies wild as hawks. In the ranks there is a pleasant admixture of female warriors with children at heel. The field kitchen goes by represented by a coolie balancing two cauldrons of rice at the end of a swaying pole balanced upon his shoulder.

None the less, the Liberation Army is extremely formidable. Its inexhaustible supply of tough, expendable manpower makes it so. Also it is plentifully supplied with small arms and mortars—though their diversity of origin—Chinese, Japanese, United States, Russian—must make ammunition supply a nightmare. Its better found units are now provided with standard Russian weapons and equipment, which include bolt-action 7.62-mm. rifles, 82-mm. mortars, 76-mm. guns both self-propelled

and towed, 122-mm. and 155-mm. howitzers, and T-34 tanks mounting 85-mm. guns. No doubt the Russians will continue this process of gradual re-equipment.

The Chinese division has a strength of 7,000 to 10,000 men, and it is organised in three infantry regiments with a modicum of supporting arms. Chu Teh follows the Soviet practice of keeping the bulk of his artillery, armour, and transport concentrated in specialised formations. Thus there are "specialised columns" or task forces strong in armour and artillery and there are also field artillery divisions. As regards mechanised transport, there is perhaps one vehicle per 500 Chinese soldiers, in contrast with nearly 3,000 vehicles per United States division.

Also—and here he can teach the Soviet Army something—Chu Teh has cut down overheads with such success that in Korea he has been able to put four-fifths of his overall strength into the firing line. The United Nations forces, on the other hand, have been able to put into the firing line no more than one-fifth of their overall strength to oppose him. Here, rather than in any overall numerical superiority of the Reds, we have the main cause of their earlier successes.

Three of these Red Chinese divisions normally make an army of 20,000 to 30,000 men. A variable number of armies constitutes a "group army." A variable number of group armies, usually supplemented by independent armies, field artillery divisions, cavalry divisions, and special columns, constitute a Field Army. In support there is a Red Air Force of 500 to 600 aircraft, among them some MIG-5 jets of very high performance. There is some doubt as to who flies these latter—since the number of competent Chinese pilots is believed to be very small.

So much for the Liberation Army. It still remains something of an enigma. Its campaigns against the Nationalists involved little serious fighting. Its earlier successes in Korea were the reward of skilful planning and of skilful utilisation of local conditions rather than of hard fighting. Thus the Liberation Army is only now being put to a real test. Since its intervention in Korea it has lost, through wounds, frost-bite, and disease perhaps half a million of its best soldiers. As related to the total Chinese manpower available, this loss is nothing. As related, on the other hand, to the total of well-trained and well-equipped Red Chinese troops in the 4th Field Army, the loss may be much more serious: 1951 is likely to show us whether or not the Liberation Army can stand up to prolonged punishment.

It is well to remember that the Liberation Army is not the only Chinese Army in being. There is Chiang Kai-shek's Nationalist Army in Formosa and the other islands, and there are the Nationalist guerrillas on the mainland.

In December 1949 the Nationalist Armies, 340,000 strong—exclusive of the Navy and Air Force—withdrew from the mainland. Their morale was low. Subsequently, however, three factors have conduced to raise Nationalist morale. First, Chiang has purged the National Government of Formosa, substituting a fairly honest and efficient military control. Secondly, when on June 29, 1950, President Truman gave the Seventh Fleet the task of safeguarding Formosa, he removed from the hearts of Chiang's men the dread of imminent invasion. Thirdly, the Nationalists have now received some supplies of United States arms and equipment.

These supplies, based on the recommendations of General MacArthur's Military Mission to Formosa, have remedied the worst deficiencies.

Chiang's Naval and Air Forces are also considerable and could be readily reinforced. On Formosa there are three large commercial air bases that would accommodate 1,000 bombers. Obviously, it would be the height of folly to allow these air bases to pass into Communist hands.

There are two serious weaknesses in Chiang's position, however. His men have had to leave their families on the mainland as hostage to fortune; and the Formosans hate the Chinese intruders with a bitter hatred.

Chiang is in touch, either directly or through Hong Kong and Macao, with large guerrilla forces, numbering perhaps 2 m., on the mainland. These guerrillas are strongest in the south-west; but they have two other strongholds, in central China and in the north-west. They are lightly armed and are chronically short of ammunition. So far they do not constitute a serious threat to the Reds, who have been able to maintain their basic communication network—and particularly the one-track railway from Canton through Peking and Mukden to Chita (Siberia), by which Lin Piao moved his 4th Field Army northward, and by which military supplies can reach Peking from Moscow. The Nationalist guerrillas are increasing in numbers, however; given arms and encouragement, they could become a serious embarrassment to Mao, and a potent reinforcement in the event of any future landing by the Nationalists upon the East China coast.

H. G. MARTIN

CHAPTER XXII

CONDITIONS OF SERVICE IN THE ARMY

I. OFFICERS

THE ARMY AS A CAREER

THE SECTIONS that follow set out to show the Conditions of Service factually. They are intended as a guide for those who require information on which to base a decision whether to enter the Army or who want to know the conditions for National Service. As an introduction it is, however, desirable to discuss some of the less tangible factors which might affect a decision to try for a Regular commission in the Army.

The obvious advantages of the companionship and outdoor life need no emphasis, but the essential characteristic of a career as an officer is that it is a life of service in which the responsibilities of leadership must be accepted with enthusiasm. The introduction of National Service has extended the scope of this leadership, and the officer of to-day has an opportunity of forming the character of a large proportion of the youth of the nation.

Modern armies are so diverse in their activities and so much concerned with technical equipment that there can be no excuse for regarding the Army as a hum-drum barrack-square existence. It is too little realised, for example, that a comparatively junior officer in a field unit may be responsible for the running and maintenance of more than a hundred vehicles. In the more technical arms almost all young officers have to undergo a university course at government expense involving the grant of a B.A. or B.Sc. degree.

An old complaint against the Army is that the average officer is left to find civil employment in his early forties. It is obviously impossible and undesirable that the Army should ever be a profession in which a young man can settle down to a steady routine with security reaching into old age, but the modern Army provides so much diverse administrative employment that any officer who keeps himself fit and efficient has reasonable prospects of employment up to his middle fifties. The nature of the Army is also such that there will always be opportunities for the more brilliant to be selected for important commands at a reasonably early age. It is obvious that the army offers no chance of the rich financial prizes which may fall to a few in business and some professions, but it does offer free training at Sandhurst, early financial independence, and an interesting and varied life of service.

NATIONAL SERVICE

The whole nation is affected by National Service, and National Service as an officer is itself a possible approach to a Regular commission. From the moment a man is called up the process of selection is begun, and normally during the first eight weeks in the ranks at an Arms Basic Training Unit a man graded as a potential officer is sent for testing to a

War Office Selection Board. The process of selection is dealt with in some detail below. Those men who pass the board go on at the end of their basic training (ten weeks) to an Officer Cadet School for a sixteen weeks' course, at the end of which the officer cadet is commissioned as a 2nd lieutenant.

Although the normal procedure is for a man to pass straight from basic training to an Officer Cadet School, this is not essential. Those who fail to get selected or who are not at first recommended can be selected for the Officer Cadet School at any time provided there is still time to complete the sixteen weeks' course and serve for a useful period as an officer before the end of their full-time service.

The acceptance of a National Service commission in no way alters the liability to serve. The National Service officer leaves the service on the same day as the National Serviceman called up on the same day. On commissioning, the officer will join his regiment or a unit of his corps, and is liable for service in any part of the world. For administrative convenience it is not usual to send officers to the more distant theatres if they have less than eleven months to serve. There is the opportunity also for service with colonial troops in West and East Africa. Within his unit there is no differentiation between the National Service officer and any other commissioned officer; he serves under the same conditions, and has the same duties, responsibilities, and privileges as a Regular officer of the same seniority.

At the end of his full-time service (at present two years) the National Service officer is liable for three and a half years' training and service with the Supplementary Reserve or Territorial Army. This includes sixty days' training, normally completed at the rate of twenty days a year, including fifteen days in camp, thus completing the obligatory training in three years. Pay at normal rates is drawn during training. In addition to the training requirement there is a liability to be called up for whole-time service in any part of the world whenever the Royal Army Reserve or any part of it is called out by proclamation, and to be called out without proclamation for service in the United Kingdom for defence against actual or apprehended attack.

An officer who fails to carry out his training or duties satisfactorily, and is consequently called upon by the Army Council to resign his commission, becomes liable to be called up for the remainder of his National Service in the ranks.

TERRITORIAL ARMY

Now, as before the war, the Territorial Army must rely on the voluntary spirit. The backbone of all units will be those officers who, after their war service, have joined or rejoined the Territorial Army. The advent of National Service has, however, given new responsibilities and new opportunities. All units now have the task of training the National Service officers and men posted to them for their three-and-a-half years' part-time service. These officers are borne on the National Service list of the Territorial Army, but it is hoped that as many officers as possible will join the Territorial Army as full members and will remain on long beyond their National Service. Only if large numbers do so will National Service pay its full dividend to the nation. The grant of a commission as a

volunteer in a Territorial Army unit is subject to the recommendation of the commanding officer and the decision of a district selection board.

The National Service officer serving with the Territorial Army is required to do fifteen days' camp training each year for three years, and a further fifteen days' out-of-camp training over the three years. In assessing out-of-camp training, one six-hour working day or four drills count as a day. This is less than the training liability of the volunteer Territorial officer, who has to do fifteen days' camp training and forty drills each year.

The future recruitment of officers for the Territorial Army will be chiefly from those who have held commissions during National Service, but it will still be possible to obtain a commission from the ranks of the Territorial Army, on recommendation by the commanding officer and after selection by a War Office Selection Board, and a short Officer Cadet course instead of annual training.

SUPPLEMENTARY RESERVE

Commissions in the Supplementary Reserve may be obtained in the same way as in the Territorial Army. For National Service officers the liabilities for service in the Supplementary Reserve are the same as in the Territorial Army; but an officer may volunteer for an additional liability to be called up for service outside the United Kingdom without proclamation when warlike operations are in progress or preparation. For this additional liability an annual bounty of fifteen pounds is payable.

The Supplementary Reserve is divided into two parts. Part I, which undertakes the additional liability referred to above, and Part II, which has only the same liability as the Territorial Army. Both Parts I and II are divided into two categories: "A," which does training in peace; and "B," which does not. The National Service officer may not, therefore, carry out his four years' part-time service in category "B" and will not be in Part I except as a volunteer. For the National Service officer the training requirement is worked off by a fifteen-day camp training in each of the three years and fifteen days' out-of-camp training spread over the three years. There are some units in the Supplementary Reserve, but it is also organised into pools to provide reserves for the Regular Army.

The method of recruitment of officers other than National Service is similar to the Territorial Army. The War Office publishes a comprehensive handbook showing the branches of the Service for which there is a Supplementary Reserve and the methods of applying for a commission.

REGULAR COMMISSIONS

The normal method of entry to a Regular commission is through the Royal Military Academy, Sandhurst, or through a university. In addition, a limited number of Regular commissions are granted direct to officers serving on National Service or short-service commissions.

ROYAL MILITARY ACADEMY, SANDHURST

The ordinary entry to Sandhurst is by the Army Examination held by the Civil Service Commissioners in February, May and October of each year, for candidates between 17½ and 18½. The standard of the

examination is that which a boy might be expected to reach in one year in the sixth form at school. No boy is allowed to sit for the examination unless he holds a school certificate, and a boy who has taken the higher school certificate (which must either include mathematics or follow a credit in mathematics in school certificate) is exempted from the written examination. Under the new general certificate of education the substitute for a school certificate is a pass in English language and three other subjects at ordinary level. The exemption standard in place of the higher school certificate will be a pass in five subjects of which at least two are at advanced level.

All boys who pass or are exempted from the examination are sent before a Regular Commissions Board, and if they pass are accepted for the Royal Military Academy, Sandhurst. Before joining they are, however, called up for four months' training in the ranks. This consists of the ten weeks' basic training course carried out by all National Servicemen and the remainder at the school of the arm of the Service in which they have enlisted.

There are three examinations annually to fit in with those of the Royal Navy and the Royal Air Force, but there are two intakes only for Sandhurst. Boys who take the October examination are called up in May and join Sandhurst in September. Boys who take the February and May examinations are called up in November and join Sandhurst in March.

It is hoped that acceptance for Sandhurst will, in the near future, depend on the competitive results in the written examination. That it has not done so so far is due not to a shortage of candidates but to the high failure rate in the examination and a high rejection rate at the subsequent Regular Commissions Board. It is probable that this is due to the difficulties of education during the war years, and that this situation will right itself.

There is an alternative entry to Sandhurst through an Officer Cadet School. By this method any soldier serving on either a National Service or a Regular engagement may apply to become an officer. He is put through the ordinary training and testing procedure for the National Service officer described above, and during his time at an Officer Cadet School he is sent to a Regular Commissions Board, and if successful accepted for the Royal Military Academy, Sandhurst. A candidate must be young enough to enter Sandhurst by the age of 19½, or in special circumstances by 21. This method of entry is intended for the boy who has genuinely been late in making up his mind that he wishes to try for a Regular commission through the ranks; it is not intended that it should be used as a method to avoid the examination. In the first few intakes after the war a number of candidates were accepted who were below the desirable educational standard, but a new procedure has now been introduced by which the Regular Commissions Board will include an education test equivalent to the Army examination. Unless a candidate can pass this, or show signs that he is likely to pass after three months' study, he is rejected. Where three months' study is necessary, it is given at a special wing attached to the Royal Military Academy, Sandhurst, and acceptance is conditional on passing the test at the end of the three months.

THE COURSE AT SANDHURST

The course at Sandhurst lasts eighteen months. During this time the cadet is paid at the highest grade in the rank he has reached (minimum rate 8s. per day). The course is designed to prepare a candidate for any combatant arm of the Service (i.e. other than chaplains, medical, dental, pay, veterinary, education, and legal). The syllabus, in addition to military subjects, comprises modern studies (history, political science, and economics), languages, science, and mathematics. The aim on the educational side is to continue the general education of the officer cadet along the line of the first year of a university course. The curriculum is divided into distinct courses so that a cadet may follow a particular bent. Cadets who intend to enter the Royal Engineers, Royal Electrical Mechanical Engineers, or Royal Signals are required to reach the standard of Intermediate B.Sc. by the end of their Sandhurst course. There is also a minimum standard in mathematics for candidates for the Royal Artillery.

In his last term at Sandhurst an officer is required to say in which arm of the Service he wishes to be commissioned. He is given three choices of arm, and where one of his choices is Royal Armoured Corps or Infantry, he may within each one express three choices of regiment. The appointment of cadets to regiments is decided by the War Office Commissions Board, who are guided by three factors: first, the needs of the Army and the number of vacancies in each corps or regiment; secondly, the place of the cadet in the final order of merit; and thirdly, a family claim to a particular corps or regiment supported by the colonel commandant or colonel concerned. The last factor is weighted by giving a lead of a definite number of places to a cadet with a claim. Thus, for example, a cadet with a claim to a particular regiment who passed out 120th might be given preference over a cadet who passed out 90th, but not over a cadet who passed out 40th. The number of places lead given will depend on the strength of the claim. The appointment of officers who enter other than through Sandhurst is decided on a similar principle, though instead of the order of merit, consideration is given to previous service record, university degree, and grading at the Regular Commissions Board.

UNIVERSITY COMMISSIONS

It is desirable that a number of officers should be recruited each year from graduates of universities. A recognised member of a university may therefore apply for a commission, and provided he obtains his degree and passes a Regular Commissions Board he is accepted for a commission with the same seniority as if he had come in through Sandhurst at the normal age. Graduates with first- and second-class honours degrees are considered to have entered Sandhurst at their first opportunity, and those with third- and fourth-class honours and with pass degrees at their second opportunity.

Degrees are specified for certain arms so as to guide a university candidate into that arm of the Service where his specialised knowledge will find fullest scope. The specifications are sufficiently broad to allow a candidate wide choice. For example, for Royal Engineers and Royal Electrical Mechanical Engineers a candidate must have a degree in engineering or

some other degree in which mathematics is included, while a degree in mathematics or natural science allows a candidate to enter any arm of the Service. A degree without mathematics or science is suitable for Royal Armoured Corps or Infantry.

DIRECT ENTRY

A limited number of Regular commissions for all arms are given to officers with National Service or short-service commissions. This is a "back-door" method of entry, and since the educational training of a Sandhurst course or a university is missed, a candidate does not count his Regular seniority before he has reached 21 years of age and given sufficient service as an officer to allow his qualities as an officer to be assessed. An officer need not, however, wait until his 21st birthday before offering himself before a Regular Commissions Board for testing. The Board may either recommend immediate acceptance subject to still being recommended on his 21st birthday or may recommend deferring a decision until the 21st birthday. The final decision will rest with the War Office, based on the grading and record of the officer and the vacancies in the arms of his choice. An officer granted a Regular commission by this method may count all previous officer service and half previous service in the ranks in order to give him seniority from his 21st birthday, but not earlier. This method of entry is, therefore, less advantageous than the Sandhurst or university entry, which normally gives a date of first commission between 19½ and 20½.

As the minimum age for the grant of a Regular commission by this means is 21, it will sometimes be necessary for a National Service officer to take a short service commission to tide him over. The minimum length of a short service commission is two years, but where a short service commission is given for the purpose of trying for a Regular commission and the officer fails to be selected, he will be allowed to resign his short service commission. Once a National Service or short service commission has been granted, entry as a university candidate is the best method and direct entry the next best method of obtaining a Regular commission. In certain special circumstances, however, a National Service officer may be allowed to give up his commission to enter Sandhurst.

SHORT SERVICE COMMISSIONS

The need of the Army is for a larger number of junior officers than the proportional requirement of senior officers will justify. National Service officers go some way to meet this need, but as they serve as officers for little more than one year it has been found necessary to retain in being the scheme of short service commissions which was introduced at the end of the war. This scheme allows for service as an officer up to eight years, at least two years on the Active list and the remainder on the Reserve. A bonus is payable at the rate of £100 for each year's service on the active list, except for two-year commissions, for which the rate is £80.

The short service commission will not appeal to the young man about to enter his chosen profession, but it may be useful for those who wish to enter a profession or business later at a mature age—say between 25 and 30. In addition, a short service commission is the only form of

commission other than a Regular commission which is open to a Regular soldier. The procedure for obtaining a short service commission is as for a National Service commission; thus it is necessary to pass a War Office Selection Board and complete four months' training at an Officer Cadet School.

PROCEDURE FOR SELECTION

Selection procedure is, in each case, based on the same principles: it is designed to give equal opportunity to all and to test the capacity for leadership. The system is based on that which grew up during the war years, and may be said to have proved itself during that time. The tests are based on psychological principles, but they are carried out by ordinary regimental officers of experience and are a straightforward attempt to assess character.

Like everything new, this selection procedure has met with a good deal of criticism. From among these critics many Army officers and many schoolmasters have been enabled to attend selection boards in action, and it is noteworthy how often the visit has resulted in complete conversion. There is therefore a strong case for assuming that the selection board system is better than the examination and interview which it replaces. It is, however, true to say that the system is accepted with no complacency; its results are kept under constant and searching review and the War Office is always willing to follow up a case where the board's results appear to be out of keeping with the candidate's school or other record. It is also apparent that the selection procedure is more easily applied to the mature candidate of 21 and over than to the 18-year-old, who in a completely strange atmosphere may occasionally fail to disclose his true self. Experience with the Sandhurst intake has also shown that apparent leadership qualities are not a complete substitute for knowledge; the boy with the inability to pass examinations often finds himself in such difficulties in competing with all that is new at Sandhurst that he is unable to give his best. There is, however, good reason to assume that in the watchful atmosphere in which the selection procedure is being built up these difficulties will be overcome.

CONDITIONS OF SERVICE

All commissions are granted in the rank of 2nd lieutenant, and promotion in the lower ranks is by length of service. Provided an officer maintains the necessary standard of professional proficiency, including passing a promotion examination for the rank of major, he obtains promotion to lieutenant after two, captain after six, and major after thirteen years' service. Rates of pay range from 17s. 6d. a day for a 2nd lieutenant up to 48s. for a major after six years, with "qualification pay" (e.g. for p.s.c. or the like) up to 5s. a day.

Above the rank of major, selection for promotion comes in a gradually increasing degree. The officer of average ability who takes his profession seriously can expect to be selected for promotion to lieutenant-colonel. Of those promoted to lieutenant-colonel about a third may be expected to be promoted to colonel and brigadier, and one in five who reach colonel's rank may become general officers.

The standard rates of pension and the retiring ages on which they are based are given below. Ages differ somewhat in different arms; those given are for Royal Armoured Corps, Royal Artillery, and Infantry.

	<i>Age</i>	<i>Standard Pension</i>
		£
Major	45	475
Lieutenant-Colonel	48	625
Colonel	54	825
Brigadier	54	900
Major-General	57	1,100
Lieutenant-General	59	1,300
General	60	1,500

At these ages compulsory retirement can be ordered, but, on the other hand, opportunity for continued employment may be offered to majors and lieutenant-colonels who remain fit and efficient up to the age of 55. There is no increase above the standard rate of pension for such service.

Voluntary retirement is normally allowed below these ages; officers who are more than two years below the retiring age suffer a cut in pension. No officer with less than twenty years' service (served after attaining the age of 21 years) qualifies for a pension. An officer of ten years' service qualifies for a gratuity of £1,000 with an increase of £150 for each further completed year's service. Officers within five years of commissioning from Sandhurst and those who within five years have undergone special instruction, such as staff college or university courses at public expense, are not normally permitted to resign or retire.

Rates of pay are designed to allow a reasonably economical and prudent officer with normal tastes and responsibilities to live on his pay. Special officer rates of marriage allowance are paid after the age of 25. Questions of sufficiency of income are so contentious and so subject to personal habits that it is difficult to generalise, but it is certainly a mistake to imagine that the majority of officers nowadays have private means. Some regiments are by tradition regarded as expensive, but even in these it is a question of community of interests rather than the size of income which matters.

WOMEN'S SERVICES

W.R.A.C.

The Women's Royal Army Corps has been established as a permanent part of the British Army, and so offers a permanent career for women officers. Service in the ranks is an essential preliminary to training as an officer, but a woman may apply for testing as an officer before enlistment, so that only if she passes the Regular Commissions Board need she actually enlist. Applicants must be over 18½ years of age and under 26, but a candidate is not called up until she is 19 and not normally commissioned before 20. Candidates must either have school certificate or show that they are of the equivalent standard of general education. The course at the Women's Cadet College is nine months. Commissions with an ante-date may also be granted to women graduates from recognised universities, on similar lines to the scheme for men.

In addition to Regular commissions there are a number of vacancies for officers with short service commissions, chiefly for specialist appointments, e.g. physical training, education, and intelligence.

Service in the Women's Royal Army Corps comprises both regimental duty with women's units and mixed units, staff appointments in normal Headquarters establishments, and secretarial, pay, and ordnance duties. Officers are liable to serve in any part of the world.

Rates of pay range from 13s. 3d. a day for a 2nd lieutenant up to 63s. 9d. for a brigadier. Pensions are at two-thirds the rate for male officers but otherwise subject to the same conditions.

R.A.M.C.

Qualified women doctors may be granted short service commissions in the Royal Army Medical Corps under exactly the same conditions as for men, that is, four years' service with no reserve liability, pay at full rates for male officers (with additional rates for specialists), and a gratuity of £600 on completion of service.

Q.A.R.A.N.C.

Nurses who have completed their training may apply for a short service commission for four years in the Queen Alexandra's Royal Army Nursing Corps. At any time after completing two years they may apply for a Regular commission. Those who do not wish for Regular commissions may extend their short service commission to complete six years. Both Regular and short service commissioned officers are liable for service in any part of the world.

SUPPLEMENTARY RESERVE AND TERRITORIAL ARMY

There are Supplementary Reserve and Territorial services for both the Women's Royal Army Corps and the Queen Alexandra's Royal Army Nursing Corps.

E. K. G. SIXSMITH

II. OTHER RANKS

INTRODUCTION

The increased tension in the international political situation and the events in Korea were reflected during the summer and autumn of 1950 in certain active steps taken by the Government which considerably affected the service conditions of other ranks in the Army. Two major decisions, one affecting Regulars and the other National Servicemen, were taken.

On August 1, 1950, it was announced that all Regular soldiers at the time serving with the Colours would be retained for an unspecified period on account of the emergency. It was announced on January 29, 1951, by the Prime Minister in the House of Commons that the transfer to the Reserve of Regular soldiers so retained would restart and that as long as the emergency existed men would not be retained longer than twelve to eighteen months after the expiry of the Colour engagement. The date of the commencement of this release is planned to be January 1, 1952, by

which date those longest overdue for release will have completed seventeen months additional service.

On September 18, 1950, Parliament approved that the period of National Service with the Active Army should be increased to two years, the Reserve liability being correspondingly reduced from four years to three and a half years. The two decisions had the immediate effect of increasing the strength of the Active Army.

Regular recruiting for all three Services had not been satisfactory, and on August 30, 1950, new rates of pay for all Regular personnel of the Services were announced. These rates were a considerable improvement on the former rates for other ranks, placing the Regular on a much better footing with his contemporary in civil life. The Regular rates of pay also applied to National Servicemen during their extra six months' service with the Active Army.

REGULAR RECRUITING

The increases in pay had a most beneficial effect on Regular recruiting, which had been steadily dropping in numbers since 1948. For the last three months of 1950 recruiting was running at approximately two and a half times what it had been before the pay increase. However, at the time of writing (April 1951) this increase has not been maintained, and although recruiting is still better than in 1949 and 1950 the figures of enlistments are not all that was hoped.

It is difficult to state exactly the reasons why men join, or do not join, the Regular Army. The pay is now comparable with that obtained in civil life, having regard to age, length of service, and trade skills in the Army. The Army offers a pleasant, healthy life, comradeship, plenty of sport, foreign travel, good food, paid leave and free rail warrants for leave in the United Kingdom, and many other compensations which appeal to young men keen to get out into the world. It offers a secure career, with a good chance of service up to 55 years of age and a pension on retirement. On the other hand, a proportion of the young men of to-day do not like discipline, many want to stay at home or in towns, and the size of the weekly pay packet received by many young men and the full employment of the present day in industry all have their effect on Regular recruiting. Young men do not always take into account the considerable value to a soldier of all the "unseen" additions to his pay, e.g. free clothing, housing, food, paid leave, rations and travelling allowances, and the many other small items which all count against a man's gross pay in civil life.

METHOD OF ENTRY INTO THE REGULAR ARMY

Boys

These can enlist as either Apprentice Tradesmen Boys or Regimental Boys.

To become an Apprentice Tradesman, a boy must first qualify at an entrance examination before going to an apprentice school where he is trained to be one of the future technicians of the Army.

Regimental Boys join units of the various arms, where they are trained as potential leaders.

MEN

Volunteers can join at recruiting centres, which are located in most towns of any size. After a medical examination, they are given tests in intelligence and educational attainment, and should they pass these, and provided their references are satisfactory, they are attested, finally approved, and sent to a basic training unit.

WOMEN

Queen Alexandra's Royal Army Nursing Corps (Q.A.R.A.N.C.) and the Women's Royal Army Corps (W.R.A.C.) are open to women. The Q.A.R.A.N.C. are employed as nurses and with the medical services, while the W.R.A.C. fill a large number of administrative trades, and these save manpower which can be more actively employed elsewhere. The enlistment procedure is similar to that for men.

TERMS OF SERVICE IN THE REGULAR ARMY

Boys

Before a boy can enlist the consent of his parents is necessary. If he wants to become an Apprentice Tradesman he takes an examination, and if he qualifies he joins the apprentice school between the ages of 15 and 16½. He can go to one of three schools, dependent on what trade he wishes to learn. The schools are at Arborfield, Chepstow, and Harrogate. He spends three years at the school and is given a good general education in addition to learning technical subjects. At the end of this period, when he joins his corps, he will have reached a standard in his trade which will enable him to become a technical tradesman in a very short time. On enlistment Apprentice Tradesmen undertake to serve at least eight years with the Colours from their 18th birthday.

Those who wish to join as Regimental Boys can do so at any time after school leaving age. They enlist at recruiting offices, and after passing medical examinations and intelligence tests they serve either with special boys' units, for example the Boys' Battery Royal Artillery, or join as band boys in the regiment of their choice.

MEN

Enlistment ages for men are between 17½ and 30. The upper age limit is extended for certain trades and ex-Servicemen. They can enlist for five years with the Colours and seven with the Reserve, or for seven years with the Colours and five on the Reserve, or for twelve years with no Reserve liability. Provided a man has completed one year's service, he can change from one engagement to a longer one. National Servicemen may become Regulars, and in addition to the normal engagements there is a special one for them of three years with the Colours and nine on the Reserve.

Men may extend their service to complete twelve years with the Colours and can then re-engage to complete twenty-two years, when they will qualify for a pension, and afterwards they can continue for further periods of one to five years.

WOMEN

Ages of enlistment for the women's Services are from 17½ to 35. They can enlist for three, four, or five years and can extend their service to twelve years with the Colours. Having so extended their service, they may re-engage in order to complete twenty-two years' service and thus qualify for a pension. There is no Reserve liability for the Women's Services.

PAY

BOYS

17s. 6d. to 28s. per week until they are 17½, when they receive men's rates of pay.

MEN

A Private earns 49s. a week on joining as a Regular and is subsequently paid according to his proficiency, which is assessed under a system of awarding "stars" for attaining certain standards of training.

National Servicemen receive 28s. a week on joining and are paid under the scales of pay which were in force before September 1, 1950.

A Corporal with three stars earns 87s. 6d. a week.

A Serjeant earns from 115s. 6d. to 133s. a week.

A Warrant Officer earns from 143s. 6d. to 192s. 6d. a week.

To these rates must be added a further 3s. 6d. per week after five year's service, and another increase of 3s. 6d. a week after ten years' service.

Married men draw marriage allowance of 42s. a week up to the rank of corporal, 49s. a week for serjeants, and 56s. for warrant officers. In addition, they receive the usual 5s. family allowance for the second and each subsequent child.

PENSIONS

After completing twenty-two years' service from the age of 18, other ranks earn a pension.

Rates for pension vary according to rank and total service, but the average pension for a serjeant is about 34s. a week. This may not seem much at first sight, but it must be remembered that a man would have to save a large amount of money before he could draw so much interest on it each week.

Reserve Pay

7s. to 14s. a week dependent upon rank.

WOMEN

A Private starts at 36s. 9d. a week and afterwards is paid on a "star" system similar to that of the men.

A Corporal with three stars earns 65s. 11d. a week.

A Serjeant earns 86s. 11d. to 100s. 4d. per week.

A Warrant Officer earns 107s. 4d. to 144s. 8d. per week.

Increments are added for length of service.

Pensions

An average pension for a sergeant would be 23s. 11d. after twenty-two years' service.

N.B.—The above rates of pay for men and women are in addition to free clothing, food, and lodging, except that married men who are living in government quarters pay rent.

NATIONAL SERVICE

National Service is likely to continue for some years to come. The Army's commitments have recently increased, and the international situation shows no sign of a decrease in tension. Under such conditions a national Army is essential, both as an Active Army to fulfil these commitments and as a training machine for the annual inflow of recruits, Regular and National Service: in addition to which the build-up and maintenance of the Reserve Army is of paramount importance. There must always be a healthy balance between the numbers of Regulars and National Servicemen; and at no time in the foreseeable future will the number of volunteer Regular soldiers be such that the balance will be entirely satisfactory.

When men are called up for National Service they first have to register at their local Ministry of Labour office. It is at this stage that those who wish to do so may apply for deferment so that their education or apprenticeship may not be disrupted. Some, however, prefer to finish their National Service first, before completing their education. After registration they are instructed, a few weeks later, to report to a Ministry of Labour medical centre, where they are medically examined and interviewed by a military interviewing officer. Finally, some weeks afterwards they are given at least fourteen days' notice to report to certain Army basic training units, where, once they arrive, they become the responsibility of the Army. National Servicemen originally served for one and a half years with the Regular Army with four years' Reserve service, but during 1950 Parliament gave approval for the Regular service to be increased to two years and the Reserve service to be reduced to three and a half years. During his Reserve service a National Serviceman does training with the Territorial Army or in the Supplementary Reserve.

CHOICE OF REGIMENT

When a man joins the Army as a Regular he can choose in which arm he would like to serve, and providing he is up to the required medical standard and passes the necessary tests, he will be posted to that arm. National Servicemen can also choose their arm, but there is no guarantee that they will get their choice, as the needs of the Army have to be considered and they will therefore be sent where they will be of most use.

The following is a list of Corps and Regiments open to a man:

Royal Armoured Corps (this includes Cavalry regiments and the Royal Tank Regiment).
Royal Artillery.
Royal Engineers.

Royal Corps of Signals.

Foot Guards.

Infantry of the Line.

The Parachute Regiment (there is no direct enlistment into this Regiment, other than for the Band; volunteers, if suitable, may transfer from the Infantry).

Royal Army Service Corps.

Royal Army Medical Corps.

Royal Army Ordnance Corps.

Royal Electrical and Mechanical Engineers.

Corps of Royal Military Police.

Royal Army Pay Corps.

Royal Army Veterinary Corps.

Royal Army Educational Corps.

Royal Army Dental Corps.

Royal Pioneer Corps.

Intelligence Corps.

Army Catering Corps.

The complexity of the equipment of the modern Army has called for a considerable increase in recent years in the technical and administrative side of the Army, and the ratio between fighting personnel and administrative personnel is most closely watched.

SELECTION

In order that no time should be wasted in training a man for a job for which he was not really suitable, a scheme was introduced during the war whereby men were given certain tests before being allotted to the various arms. These tests were designed to estimate each man's intelligence, aptitude, and attainments. After his tests he is interviewed by a Personnel Selection Officer and his future employment decided. This system proved such a success that it was continued after the war and is now firmly established, and every man or woman who joins the Army, either as a Regular or as a National Serviceman, now undergoes this selection procedure.

RESETTLEMENT

Although it will shortly be possible for some men to remain in the Army up to the age of 55, numbers will come out in three age groups of about 25, 30, and 40. Much work has been done in the last year to smooth out the transition from the Army into civilian life, with the object of ensuring that the Regular soldier is looked upon, even while in the Army, as part of the working community and not as a being in another world.

As he will be starting to look for a job later in life than the civilian, certain concessions have been obtained for him. Age limits for entry have been raised in the Civil Service and Local Authorities and Statutory Bodies. Certain nationalised and privately owned industries, commerce, and finance have agreed to keep a quota of vacancies for ex-Regular Servicemen.

The Army itself runs a very efficient Resettlement Service under the Royal Army Educational Corps. This service not only gives men education and training in some 600 different correspondence courses, but keeps

him in touch with the civilian labour market throughout his service. A monthly *Resettlement Bulletin* is published, and expert employment boards, on which the Ministry of Labour is represented, interview each man before his release. A man can thus prepare himself for Institute and Civil Service examinations or City and Guilds or up to inter-degree standard.

When a soldier has not had the opportunity in the Army to keep in touch with a trade recognised in civilian life, the Royal Army Educational Corps offer him a month's refresher course at the Army College at Welbeck Abbey. The Ministry of Labour and National Service also run courses in trades, agriculture, and business, both at their training centres and with civilian firms, to help officers and men to pick up the threads of civilian practice.

In all this work of resettlement invaluable help has been given by the National Association for the Employment of ex-Regular Soldiers, Sailors, and Airmen.

TERRITORIAL ARMY

Before the war the Territorial Army was an entirely voluntary organisation, but now it consists of both volunteers and National Servicemen who undergo their part-time service in it. National Servicemen are encouraged to join as volunteers, and it is the volunteer element that is of such importance; from it the long-service officers, warrant officers, and senior N.C.Os. are produced who form the backbone of the Territorial Army in peace and a framework on which to expand in war.

SUPPLEMENTARY RESERVE

This was also entirely voluntary at one time, but is now composed partly of volunteers and partly of National Servicemen. It is not organised on a territorial basis as is the Territorial Army, but on a functional basis, and the men in any one unit may come from all parts of the United Kingdom. This organisation is based on the fact that the Supplementary Reserve is primarily technical, and recruiting on the territorial basis might either denude a particular area of a certain type of technician or tradesman in war or be unable to raise sufficient men of the required nature from the area concerned.

H. M. LIARDET

CHAPTER XXIII

ARMY TRAINING AND MILITARY SCHOOLS OF INSTRUCTION

INTRODUCTION

THIS CHAPTER starts with a review of the main training events during the fiscal year 1950–51, and goes on to an examination of the system on which training in the Army is based, dealing in particular with the part played by Schools of Instruction. Whilst each event referred to may in itself seem small, in sum they add up to real progress and achievement. It would be pointless to give details of plans for 1951, as by the time this is published they will largely have become reality or been changed in the face of major events.

BACKGROUND

Five events have occurred during the period, all of which profoundly affect training, although only one is strictly within that field. It is against this background that the value of the year's work should be assessed.

- (a) The extension of the period of National Service from eighteen months to two years.
- (b) The reforming of three Regular divisions.
- (c) The setting up of an Allied Headquarters in Europe under a Supreme Commander.
- (d) The decision to call out for training a number of Z Class Reservists.
- (e) The continuance of the Korean campaign.

When National Service was increased from eighteen months to two years the size of the Army was automatically increased by so many thousand men, which made it possible to reform certain divisions; but the gain to the Army was not so much that number of extra men as that number of trained soldiers. What this really means is clearer if viewed from the point of view of a commanding officer. That good young private he has had his eye on will now become an N.C.O., and there is a shortage of good young N.C.Os. That corporal who has done so well but has declined to stay on as a Regular will be with him for another six months to lead and command his section and to help train the young entry, and in those six months he will get a lot better. Mr. X, who is such a likely lad, will take all the worry off his Company Commander's shoulders about that platoon for the next six months, and there is no doubt that if the worst happens he and his men will not be found wanting. In brief, the effect is to raise the all-round level of training and so of operational readiness.

The decision to form three Regular divisions has made it possible to stage divisional and higher training in the United Kingdom, employing properly constituted formations and units at realistic strength. To date

this has only been possible in Germany. The effect of this is difficult to express precisely, but it may well be described as a tonic—the best tonic the Army could have. The training of the individual and of the unit loses much of its zest and purpose, indeed is incomplete, if it does not lead on to exercises in the field by the whole division. Without such exercises the soldier can never see for himself where he fits into the picture, nor can he get that all vital practice in road movement, learning how to avoid congestion, and experience the effects of hostile air attack. Without exercises at divisional level and higher, commanders and their staffs, communication and administrative personnel get no practice. All the book learning in the world, study, and exercises without troops cannot replace practice on the ground with troops; it can only be a highly necessary preliminary to it. A division is a team, and like any team it cannot give its best in match play unless it has first had practice games.

The main training effect of the establishment of the Allied Headquarters in Europe under a Supreme Commander stems from the two words—“supreme” and “commander.” No more need be said; the advantages which flow from having one man to take a grip of training and give it inspiration are obvious.

The object of calling out a part of the Z Class Reserve is fundamentally training. The effects are two-fold: upon the unit and upon the individual. The unit profits in that it will get to know its Reservists, can fit them into their places, and weld the whole into a team. The individual, who is already a trained soldier (which is the important point), profits by taking part in unit training, during which *inter alia* he can brush up his knowledge of weapon techniques and procedures, and by familiarising himself with new equipments introduced since he left the Service. The other individual to whom great advantage accrues is the commander, for he is being given practice in the handling and training of full-strength units. The overall result, therefore, is that should the “shown down” come the units which have had their reservists for training will be away to a far better start than would otherwise have been the case.

It is an old saying that the proof of a pudding is the eating thereof. The ultimate test of the soundness and thoroughness of tactical doctrine and of training is battle. The reports in the Press on the performance of the 27th and 29th Brigades in Korea have, especially when read between the lines, encouraged the belief that little was wrong in these directions. This belief was clinched officially by Lieutenant-General Sir Richard N. Gale, Director-General of Military Training in the War Office, during his visit to Korea in the spring, when he stated publicly that our tactical doctrine and training had been shown by operations to be thoroughly sound.

THE PATTERN OF TRAINING IN THE BRITISH ARMY

The pattern of training of the Army has followed the same lines as that reviewed in the *Brassey's Annual*, *Armed Forces Year Book* 1950. There have been no major changes in military training policy. The drive to obtain a higher degree of individual skill and proficiency with weapons is showing good results. Ever since the late war it has been necessary to use, some may say to misappropriate, a number of Regular Armoured and

Infantry regiments as a part of the basic training organisation. By the time this chapter goes to Press all these regiments will have been released from this recruit training role to take their place once again in the Field Army as active units, and will have been replaced by static units specially organised to train recruits.

It has also been decided that Infantry shall go back to the pre-war system of training their recruits in their own regimental depots. It would have been ideal to have gone straight to this system when the Regular battalions were pulled out of the recruit training role, but for a number of reasons this could not be and the change had to be made in two stages by interpolating static group Training Centres.

In the sphere of field training with troops rather more was achieved in 1950 than in previous years. The reports on the 27th Brigade, the first brigade with British troops to go to Korea, are in themselves a high tribute to the work which had been done in Hong Kong, the station from which they were sent. It would be out of place here to comment on operations in Malaya, beyond remarking that what has been achieved is proof in itself that there is little wrong with the men or their training. The distribution of the troops in the Middle East theatre, combined with their varied operational commitments, has prevented concentration for exercises on a divisional scale. Field training has consequently been restricted to the regimental and brigade level. In Germany training culminated in a fully integrated Army/Air exercise. Here the international quality of the training has been retained through the medium of one national taking part in the exercises of another. In the United Kingdom the scope of field training was extended. In Southern Command brigade exercises were held, and in Eastern Command it was possible to conduct an exercise on a divisional scale, though headquarters and communication system were of an improvised nature and units were at low strength. Anti-aircraft Command have been most fully exercised, in conjunction with R.A.F. Fighter and Bomber Commands.

At home the Chief of the Imperial General Staff's annual exercise and study was held at Camberley in the early summer, and dealt with problems of defence. Unlike the previous year, it was not confined to the Commonwealth, but was attended by high-ranking American and Western European officers. Subsequently this was broken down into a series of exercises held at Command level to study more detailed aspects of the problems, and in certain cases to study special aspects peculiar to one arm of the Service.

Civil Defence studies and exercises have been held at Command and District level in the closest conjunction with the Civil Defence authorities. Following upon the establishment of the Civil Defence Staff College at Sunningdale a very close link has been forged with the Army Staff College at Camberley. The Army has put into effect its policy of using the Civil Rescue Training Centres to train instructors instead of setting up a separate organisation of its own.

The Army has long had a system for encouraging officers and men to learn certain languages up to a colloquial standard; generally the languages were confined to those required in certain overseas theatres. The system has now been expanded to cover the whole North Atlantic Treaty Organisation group of languages and certain restrictions removed, so that anyone, irrespective of where he is located, can, for example, take a test in French

and if he passes draw the specific award. Broadly, the colloquial standard will enable an officer or other rank to converse intelligently with military personnel, police, and public officials, to read and write short notes, and to make sense of more elaborate papers, public notices, and newspapers. It includes the obligation to be able to read and write in the script of the country.

TRAINING WITH ALLIED AND COMMONWEALTH COUNTRIES

“Harmonisation of tactics and procedure” and “Non-material standardisation” are two cumbersome expressions which have recently taken their place in military jargon. Being interpreted, they both mean that Allied Forces cannot operate together with real efficiency and flexibility unless they all “talk the same language.” This is not indicative of an intention that they should all talk English or French or German. Far from it, but they must all put the same meaning to an expression or word and in many things use common techniques and procedures. A few examples make this clearer. The Tactical Air Forces of one nation are liable to be called upon at short notice to support the ground forces of another nation. Unless there is a standard drill, and common jargon, to call for that support, delay and confusion will arise. The rapid reinforcement of places threatened by air attack is made infinitely more complex if differences in anti-aircraft fire control procedure so tie the commander down that he cannot reinforce the defences of threatened areas with units of varying nations. During the last war the technique for concentrating the fire of all artillery within range on to one target in a matter of minutes was reduced to a fine art, and thereby placed a devastating, and highly flexible, weapon in the hands of a commander. In a battle where Allied formations are fighting alongside each other, unless the technique of doing this has been sufficiently standardised, much of the power of this weapon will be lost. The instructions by a French general to a British commander on his counter-attack role may fail to fulfil the general’s requirement, even if the counter-attack is perfectly executed in keeping with the British doctrine, unless the two nations have the same concept of the function of a counter-attack. Whilst absolute standardisation of tactics, procedure, drills, and jargon may be desirable, it is often neither essential nor obtainable. What is essential is to obtain sufficient standardisation, or harmonisation, to ensure that Commanders lose nothing in flexibility and fighting power.

As a part of this business of learning to “talk the same language” a series of meetings between officers responsible for training in the Western European War Ministries have taken place. Their particular concern was to co-ordinate training effort and develop ways and means by which one nation can help another in its military training. They have also been very valuable in affording an opportunity for these high-ranking officers, and for their staffs, to meet each other and discuss problems of mutual interest.

In this sphere special emphasis has been placed on the training of officers. The “exchange au pair” plan which was originated between the United Kingdom and France is now being extended to other countries,

and in addition exchanges between the Officer Cadet Training Colleges have started. The objects of this scheme are:

- (a) To further good relations between the members of the Armies of the North Atlantic Treaty.
- (b) To promote a useful medium for exchanging ideas on training matters.
- (c) To obtain an insight and knowledge of Allied Armies system of organisation and training that will develop a mutual feeling of respect and understanding.

It is achieved by a system of attaching Allied country officers to British units and British officers to Allied Army units. Normally the period of attachment is for three weeks. The bulk of the exchanges are on the major and captain level. Unfortunately, few Territorial Army officers are in a position to accept attachments of this length. There is no shadow of doubt that the scheme is paying a dividend out of all proportion to its cost in terms of money and time.

Attendance on courses at each other's schools, exchanges of training manuals and books, exchanges of units for training, attendance at each other's indoor exercises and studies and at demonstrations are other methods employed to achieve this end. Of these attendances at courses is probably the most valuable. It is on courses that the frankest exchange of ideas takes place. Courses are far from being a one-way affair, as is typified by the snow warfare courses in Germany for British personnel organised by Norwegian instructors.

The acceptance by the French Government of an invitation to send an anti-aircraft battery to carry out a fortnight's practice firing during the early autumn is an instance of the type of exchange which has originated from these meetings of the Directors of Training, and which are being extended in scope.

Experience of integrating Allied units in the Anti-Aircraft Fire control system was gained in Exercises "Cupola" and "Emperor." For "Cupola," which took place under the direction of the Western Union Cs.-in-C. Committee, the Royal Artillery provided a Fire Command Troop to man an Anti-Aircraft Operations Room in Paris; and this proved very successful. "Emperor" was a British exercise incorporating many Allied Air Force units, who so monopolised the space in the Press that the participation of the French Army personnel in the anti-aircraft system seems to have escaped notice.

On a higher plane, two most important Allied indoor studies were conducted during the year. The first was held at Old Sarum by the Air C.-in-C. Western Europe to study the technique of handling Tactical Air Forces in support of Land Forces. The second was held at Fontainebleau by the Land Forces C.-in-C. Western Europe, and was attended by Defence Ministers and Chiefs of Staff. This was designed to cover a wide range of problems concerning the defence of Western Europe.

Very close training liaison is maintained with the United States Army through the medium of liaison officers, exchange of manuals and pamphlets, attendance at each other's courses, and by a system of exchanges of unit officers, akin to the "exchange au pair" plan which has been working for some time between the British and American Occupation Forces

in Germany. Lieutenant-General Sir Richard N. Gale visited training establishments in the United States early in the year and this was followed by a team of officers charged with making a detailed comparison of organisation system, and methods of training, employed in the two Armies. Participation by units in each other's exercises has continued to take place in Germany.

Co-ordination and liaison within the Commonwealth has continued through the well-established channels of liaison staffs and the full and free exchange of courses. Help has been given to Pakistan and India, to whom, in addition, a considerable number of officers and N.C.Os. are on loan to assist them in establishing their training, particularly in the technical field. Training Missions have continued to be located in Burma and in various countries of the Middle Eastern area.

The laborious process of obtaining planning clearance to purchase land for training, or to acquire training rights over land, has gone steadily forward, and an end to this tedious business (the object of which is to replace temporary rights held under Defence Regulations with long-term arrangements) now appears to be in sight. The task of searching war-time training areas for unexploded missiles has been continued, in spite of a shortage of labour, and is expected to end during 1951. The fact that a few accidents have happened even on areas which have twice been searched show that it is virtually impossible to guarantee that an area is clear. Rank grass, brambles, bracken, heather keep the face of a mine detector so far from the ground that it ceases to be effective. Under these conditions a method of visual searching may have to be adopted. But even when the teams work the ground shoulder to shoulder, with arms linked, the possibility of human error remains, especially if they have walked the ground for three days without finding anything. The ultimate solution to avoidance of accidents must rest with the public, working on the golden rule of "don't touch suspicious-looking objects, but mark them and tell the police." The police can then call in the military experts.

Within the limit of funds available, a start has been made on developing some of the major training areas by installing mechanical and remote-controlled targets. The aim of this development work is to produce more realism in tactical training when using live ammunition. Typical of what is being done is a scheme for a company in the attack. A suitable piece of ground within the training area is selected. The opposing defensive opposition is sited in detail, and targets and weapons are installed to represent the enemy. These are remote controlled and can be made to appear, or to fire, by the officer conducting the exercise in any order or sequence required. Such an arrangement can, of course, be made on a larger scale to exercise a battalion supported by tanks and artillery. The development of training areas on these lines is most advanced in Germany, where some of these tactical arrangements are extremely realistic—being complete with silhouettes of men and tanks moving forward across country, mock-up buildings, and automatic weapons firing dummy ammunition.

THE SYSTEM OF TRAINING IN THE BRITISH ARMY

Before turning to examine the system of training in the British Army it will be of advantage to refresh the mind on the general system of command.

The Army is split up into Commands: Far East, Middle East, B.A.O.R., etc.; the Home Commands—Southern, Eastern, Western, Northern, Scottish; and Anti-Aircraft. There are a number of small stations, but they need not be mentioned individually. Each major Command is under a Commander-in-Chief, who is responsible to the War Office, but he is not automatically responsible for everything concerning all the troops located in his area. It is a broad principle that an installation, or unit, whose task is to serve the Army as a whole, shall not be placed under the absolute control of any one C.-in-C. They are War Office units and, therefore, come directly under the War Office. Overseas the C.-in-C. will probably have only one or two such "lodger" units who take their orders from, and report direct to, London. At home it is different. Here there is the whole United Kingdom base, consisting of the great administrative installations, depots, workshops, hospitals, and the training organisation composed of the recruit or basic training units and the Schools of Instruction. The degree of control over these training installations, which is delegated to the Cs.-in-C., varies. They will certainly be responsible for discipline and day-to-day administration, and they may be responsible for more. A C.-in-C., therefore, only exercises full command over those units which are assigned to him, which normally means all the Regular, Territorial, and other Reserve formations and units of the Field Army which are located in his area. The chain of command passes down from him to the Division Commander to the Brigade Commander and to the Commanding Officer of the unit. The omission of the expression "District" may cause some confusion. A District is a static headquarters on the same level as a division. In the United Kingdom the two headquarters are usually amalgamated under one commander, such as Salisbury Plain District/6th Armoured Division. The Divisional Headquarters can be extricated, leaving behind the Deputy Commander and a small staff to run the District. The Corps organisation is not retained in peace-time.

The foundation of the British military training system is the responsibility of the Commander, at whatever level he may be, for the training of the units or men under his command in accordance with a common doctrine. The policy of common doctrine requires that the tactical and training doctrine must be the same throughout the whole Army. But this does not mean rigidity or a cramping of the initiative of the individual. Basically the doctrine is laid down in the manuals and books. A manual such as *The Infantry Division in Battle* sets out principles and policies within which the man on the spot has to adapt their application to local conditions of climate, terrain and the enemy's methods, organisation and weapons. In the sphere of procedure and technique, however, it is different because it is essential that everyone does the same thing. The book, therefore, lays down the "drill" to be used in detail, as is typified by the Royal Artillery pamphlet on Target Grid Procedure, which is the drill for the correction of fire on to the target by observation of fall of shot.

Training is controlled by the War Office, which has a Directorate of Military Training as a part of the General Staff. It is headed by the Director-General of Military Training, who is a Lieutenant-General. The staff of this Directorate have two main functions—tactical doctrine, and training. Training flows naturally from tactical doctrine. The first

thing, therefore, is to evolve the tactical doctrine and to keep it constantly under review as new weapons are developed. The next thing is to put this doctrine across to the Army. This is done in four ways. Through the normal chain of command starting at the top with a War Office exercise or study, by means of manuals and pamphlets, by issuing directives from time to time, and through the schools of instruction. The training function can be broken down under two sub-heads. The first is to assist Commanders-in-Chief to train their commands by co-ordinating the effort of Commands and other Services, by making provision for facilities in the form of funds, stores, ammunition, and training areas, and by planning for the future. The second is to control and direct the effort of the training units and installations which are designed to serve the whole Army—that is, the basic training organisation and the schools of instruction. There is no clear-cut division of the staff between functions. Although the main responsibility for one may be vested in a particular section, all have a hand in each. The effort of the whole is directed to the one end of helping the commander to train his unit or formation in accordance with the common doctrine and so to produce an efficient fighting concern.

The Chief of the Imperial General Staff's annual study, and its derivatives, which were mentioned earlier in this chapter, provide excellent examples of this overlapping, or indivisibility, of function. A study such as this serves the twin purposes of crystallising and developing doctrine, whilst at the same time "pushing it out" to the whole Army.

The hallmark of British training is the individual—the highly skilled and trained individual capable of thinking for himself and getting the most out of his weapons and equipment. It is a tradition which goes right back to the longbowmen at Agincourt, and the results can be read down the pages of history, through 1914 when the marksmanship of the "Old Contemptibles" made the Germans think they were faced by a mass of automatic weapons, to Korea, where the Argyll and Sutherland Highlanders and the Middlesex Regiment fought their way over the hills with only their own weapons to aid them. "Skill at arms" it used to be called, and though the expression still remains to-day it has a wider meaning and covers the whole gamut of equipment used by the soldier—from rifle to radar. But the tradition, the requirement, stand unchallenged, a craftsman proud in mastery of the technique of his job. Private Thomas Atkins is a hand-made article, whereas G.I. Joe is mass produced. But this requirement of a highly trained individual does not apply only to the private soldier. It applies even more to the officer: the development of initiative, knowledge of his profession, the ability to act on a directif, and if things go astray to make his own plan to fit in with his superiors' general intention. It is upon the individual, therefore, that the main effort of training is concentrated. The programme of training is founded on a yearly schedule starting with a lengthy period devoted to the individual and then progressing through the levels of team training from section to platoon and so on up to higher all-arms exercises and manœuvres. In the ideal state the schedule should be taken in that order, but as the recruits come into the units at intervals throughout the year to replace the men whose time is up, and as operational requirements dictate a constant state of unit readiness, it cannot so be done. What results is a

schedule with a decided bias at the beginning to individual training with exercises interlarded, followed by team training with individual training interwoven. The thing that matters is for the man to cover the whole gambit in the course of the year. In fact, experience has shown that the man benefits from being pulled out to do a field exercise in the middle of his individual training. Conversely, a spell of individual training following on exercises is often exactly what the unit commander and his officers want. It gives them the chance to correct weaknesses.

After leaving the recruit training until the man goes through the year's cycle at the end of which he should be a well-trained soldier. What happens after the first year depends largely on the individual himself. The policy is steady progression. The dullard will probably have to be content with being retrained on what he has done before in the hope that he will do it rather better. The brighter man may either be trained to a higher standard in the same employment and given more responsible work (e.g. the cargo truck driver will take on a gun tractor), or be switched to a new employment (e.g. the truck driver can be taught to use a radio set so that he may become a driver-operator), or be trained on as an N.C.O.

Throughout the National Serviceman has the same training as the Regular; but as he has a total of only two years full-time service he will not complete the second year in a unit. On an average he will do about six months of it. In that time his training goes progressively on, so that he may be of maximum use to his unit.

The task of units of the active army is to be prepared to engage in active operations at short notice. They are not, therefore, called upon to undertake the initial training of raw recruits—except as an emergency measure. To do so would result in an all-round lowering of the unit's standard of training and efficiency to an extent which would not be acceptable. A characteristic feature of the British system, therefore, is the machinery for the training of the recruit which is called the Basic Training Organisation. This supplies the units of the Active Army at intervals throughout the year with batches of men, who have been trained to specified standards, to make good the men who have become time expired.

The stage is now set to see how training is organised within the unit. It is an intricate and personal business. The Commanding Officer directs, organises, supervises, goads, and inspires; but confines direct instruction to his officers. On the Company, and equivalent, Commanders will fall the main weight of responsibility for the actual instruction of the man. Details of method vary between units, but as a general pattern he has the task of the detailed day-to-day programming of work, decision on what exactly is to be included in a specific period, assistance to his junior officers and N.C.Os. in preparing their work, and finally ceaseless checking up on how the instruction is being carried out. Upon him and the Commanding Officer fall burdens which never beset their predecessors. If a unit is 60 per cent. National Servicemen and they do eighteen months in the unit, this works out at an annual turnover at least 40 per cent. Such a rate of turnover creates a very heavy individual training load. As the National Service element provides a big proportion of the junior officers and N.C.Os. there is a ceaseless task of training new instructors, who, being inexperienced, require more help, guidance, and supervision than would long-service Regulars. Finally, there is the complexity and multiplicity of

equipment in modern units. The effects are cumulative and place intense strain on the professional Regular officers and N.C.Os. The days when the Commanding Officer and his Company or Squadron Commander could hunt and shoot three days a week have long passed!

The British Army believes in small classes in which the instructor can give the maximum attention to each individual; the Americans believe in mass instruction with classes as high as 250. Yardsticks are dangerous, as it depends on what is being taught, but a fair guide is a corporal to teach eight men weapon training. Quite obviously it is beyond the capacity of Army schools to train all the instructors of a unit. The Commanding Officer, therefore, sends only a few officers and N.C.Os. to courses at schools. On their return they then run short courses for the rest of the unit instructors, who in turn hand it on to the men. These are called unit cadre courses. Some yardsticks again must be given. It is considered that an Infantry battalion requires two officers and three N.C.Os., who have taken an instructor's course at the Chemical Warfare School, but numbers vary according to subject. For example, in signalling, in which there are fewer men to be trained, one officer and one N.C.O. will suffice. These two, aided by one or two old hands, will normally teach the man direct instead of through the medium of cadres.

Concurrent with the training of the individual man is the training of the officers and N.C.Os. in their tactical and technical duties. The tactical training is done largely on "officers days," held weekly or fortnightly, when the Commanding Officer collects all his officers together, leaving the unit to be trained by Warrant Officers and N.C.Os. The Tactical Exercise Without Troops on the ground, or the study indoors on a model, are two well-tried methods, which, whilst having the advantages of being economical and of allowing the individual to make mistakes and learn from them without wasting the time of the rank and file, providing ample opportunity to discuss and thrash out points and explain the pros and cons of a particular course of action. They also permit problems to be studied on ground which could not be used for exercises with troops owing to the damage to agriculture.

The tactical training of the unit is done by means of exercises, starting at the bottom with the section and platoon, and working up to manœuvres. The effectiveness of an exercise depends first upon how well it has been prepared beforehand and secondly upon umpiring. This all takes time, and most of the work falls upon the Commanding Officer and Company Commanders. In a battle the bullet is the umpire; in training the probable effect has to be assessed and the exercise accordingly controlled by teams of umpires. They have the second task of observing mistakes, so that they can be brought home to individuals and later corrected.

THE BASIC TRAINING ORGANISATION

The French Army adopt the system of training their recruits from the beginning in units of the Active Army. Their intakes come in half-yearly. The result is that at certain periods of the year, immediately following the intakes, they are in a highly vulnerable condition. The British Army has avoided this, first through the medium of the Basic Training Organisation and secondly by having intakes at fortnightly intervals throughout the

year. The Basic Training Organisation is organised by arms, each arm having a number of units which are controlled and held together by a brigade headquarters, or similar headquarters of that level. The policy and syllabi of training are laid down by the War Office, to whom units are responsible—with the exception of the three principal combat arms, Armour, Artillery, and Infantry. Commanders-in-Chief are given the responsibility of supervising the work of these latter and of seeing that the War Office policies are put into effect. The task of the Basic Training Organisation is to receive the recruits into the Army from civil life, both Regular and National Service, to process them, and in due time despatch them to units trained up to the standard at which the active unit can absorb them effectively. This standard varies not only between arms but between the Commands to which men are sent. An Infantry battalion in Germany can devote more of its time to training than can one in Malaya or Korea; therefore it can accept drafts at a lower standard of training. The system is a compromise compelled by reasons of manpower. The ideal is to send fully trained recruits to every unit, but it is too uneconomical. In an army of a fixed size a balance has to be struck between the size of the training organisation and the number of recruits under training on the one hand, and active units on the other. The more the former accounts for, the fewer there are to go to the latter. The problem, therefore, is always to try to reduce the former. The processing of the intakes includes selection. On arrival in their basic training units all men are put through a selection process. The object of selection is to find out the individual's background, qualifications, experience, and aptitudes, and as a result to decide upon the military employment for which he is best suited to be trained. Stated another way, the object is to avoid putting square pegs into round holes.

Strictly speaking, the Officer Cadet Schools, the Army Apprentice Schools, and the Regimental Boys' Units belong to the basic training organisation in that they are concerned with training prior to initial posting to a unit of the Active Army. The Royal Military Academy trains the Regular officers. Courses start twice a year and last eighteen months. On conclusion, the cadet receives his commission and, in the majority of cases, goes to the school of his arm to do a short technical course before posting to a unit. In the case of Engineers, Signals, and the Electrical and Mechanical Engineers, he usually goes to the Military College of Science to take the degree prescribed for his particular arm of the Service. The Officer Cadet Schools have the task of training the candidates for National Service commissions. Potential cadets are earmarked during the selection process and put into special training squads. The field is weeded out, and others are added to it, during this period. The candidate is then sent up before a War Office Selection Board at about his seventh week of service. Those selected as likely to make officers are sent after a total of ten weeks' basic training to one of the Officer Cadet Schools.

The question may well be asked why it takes eighteen months to train a Regular subaltern and something nearer six for a National Serviceman. The answer is that the requirements are fundamentally different. The National Service officer is short-term. He will have a little over a year in the Active Army followed by three to four in the Territorial Army. Therefore, when he leaves the Officer Cadet School and goes to his unit,

the requirement is that he should be able to command and train a platoon. This fulfils the policy of obtaining the maximum usefulness from National Servicemen. The cadets at the R.M.A., Sandhurst, to-day are the Commanding Officers of 1975. Their training is long-term. The requirements in their case are that they should arrive in their units with a firm foundation upon which to build their military education, and with a sufficient mathematical, technical, and scientific knowledge to enable them to compete with the present and future requirements of their arm. It is this looking ahead, combined with the ever-increasing technicalities of equipment, that makes it essential to pass the young officers of certain arms through the three-year degree course at the Military College of Science after they have left Sandhurst.

The Army Apprentice Schools are long-established institutions directly under War Office control and organised to serve the whole Army rather than one particular arm. They take in boys between 14 and 15 years old and give them three years' training as technicians. On mustering to man's service at the end of the course, the individual is under an obligation to serve eight years with the Colours plus four on the Reserve. Entrance is based on an examination. The current difficulty is to obtain enough boys of adequate educational standard. Regimental Boys' Units are organised by arms, but come directly under the War Office. They are in a sense apprentice units, but instead of training technicians they set out to produce the Warrant Officers and senior N.C.Os. of the future. They apprentice boys in the art of leadership. Certain of these units are of ancient tradition, the best known being the Boys' Battery, Royal Artillery. Many a Battery Serjeant-Major began life as a Trumpeter, and it is not unusual to find boys in this battery whose fathers and grand-fathers began their military career in the same way. The system has been considerably expanded during the year and applied to other arms, especially in the Infantry, where the unit will probably be called a Young Soldiers' Battalion. Boys are taken in between 14 and 17½ years of age dependent upon local educational conditions. They muster to man's service between 18 and 18½, and then have an obligation to serve periods similar to those of apprentices. The syllabus of instruction covers education (where the aim is to reach the standard of Army First Class Certificate), foot and arm drill, weapon training, fieldcraft, games, physical training, swimming, religious instruction, health training, and a limited amount of training special to their arm of the Service. Much of the work is done out of doors. The attitude of these units is to use the syllabus to produce a junior leader—that is a person who is physically, mentally, and morally fit, and to produce an incipient non-commissioned or warrant officer—in other words, a young soldier well grounded in the fundamentals of his profession and ready to undertake further training so as to become fully proficient.

SCHOOLS OF INSTRUCTION

Some schools have been long established, such as the Staff College and School of Artillery; others are of more recent foundation, having been brought in when a new arm was formed (i.e. the Royal Electrical and Mechanical Engineers), or to cover the introduction of new equipment (which caused the setting up of the Mechanical Transport School), or

to fill an obvious need (such as the School of Infantry). The aim is, however, to keep the number of schools down to a minimum.

The task of schools is to carry out one or any of three main instructional functions—to train instructors; to train certain officer and N.C.O. specialists and technicians; to play a major part in the professional education of officers and certain warrant and non-commissioned officers. They carry out their instructional function by running courses. Schools have, however, a second and highly important set of functions in that they are centres of knowledge and study, constantly receiving back ideas and thought, and are in a position to look ahead and think about future trends and development. They are, therefore, specifically enjoined to make considered recommendations to the War Office for changes in doctrine and textbooks. As a subsidiary of this function they write pamphlets and manuals under War Office direction, and assist in the making of training films. In addition, some schools have responsibilities for testing and trying out new equipment. Responsibility for maintaining liaison with their opposite numbers throughout the Commonwealth is vested in the Commandants, and contact with North Atlantic Treaty country schools is encouraged through the “échange au pair” plan.

Long experience has shown that certain courses are always in demand, and they might be called the standard ones. There are others which are “kept in store,” as it were, and pulled out and brushed up when they are wanted. Sometimes new courses have to be organised to meet a specific demand, such as the introduction of a new weapon or technique; subsequently they tend to fade out and the subject is taken up in one of the standard courses. The general system is for the War Office to estimate the number of vacancies wanted yearly on a course, and, in conjunction with the school, to work out a programme. Commands are then offered quotas of vacancies. Nearly all the instructors' courses are short, varying from two to twelve weeks. Some courses, designed to train specialists and technicians, are, however, much longer, going up to nearly two years.

The system of instruction on courses is founded upon drawing out the individuals rather than pushing knowledge into him in the spirit of “that is how it is done, take it or leave it.” Nevertheless, much as free discussion is encouraged, it is always obligatory upon the instructor to bring his class back in the end to the doctrine or procedure defined in the manuals. In this system there is no place for examinations. Such tests as are used are for the purpose of checking the progress of the individual and the soundness of the instruction. It is assumed that the individual is on the course because he wants to learn and, therefore, that he will not get the best out of it if he has an examination hanging over his head. Whether he qualifies or fails and the grading he is given are decided not by examination marks but by the impression he has made on his instructors.

The professional education of the officer is a continuous business. In part it is his own responsibility to increase his capacity by the study of the textbooks. The reintroduction of promotion examinations will encourage and enforce this. It is also the responsibility of the Commanding Officer, who in the process of training his unit will make sure that his officers are tactically and technically efficient, and who will give such other assistance as he can. But except for a very brilliant few there are limits to what can be achieved thus, limits of facilities and time to study. This is where

the career courses come in. At the bottom are the Young Officer courses. Nearly every arm now sends its young officers, prior to their first assignment, to a school to learn the technique of their job; or as an alternative send them to school within a year or so of first appointment. The next group of courses is at the senior captain-junior major level, which is where the individual aspires to put a second string to his bow. The cream of this group is the Staff College at Camberley; it also includes the Technical Staff Course, the Gunnery Staff Course, which is part instructors and part career, Petroleum Engineering course, and others special to different arms. These courses last about one year. There are a number of short courses, of the four- to six-week type, which belong to the same or a slightly higher age level and which are intended to broaden the outlook and increase knowledge in a particular direction. Intelligence, Special Weapons, and Combined Operations staff courses and the Land/Air Warfare course are examples of this type. Going up to the lieutenant-colonel's level there is the Joint Services Staff College course, which is the main one; attendance at the Administrative Staff College, which is a civil-run institution; and various other technical courses. The broad object of this group is the same, to take the experienced staff officer, or potential commander, and train him for higher things by opening out the whole scope of his study. Finally, at the top of the tree, for the chosen few, there is the Imperial Defence College.

Schools are organised both functionally and by arms. Those subjects which are common to the whole Army are dealt with functionally, whereas those peculiar to any one arm are dealt with by the school of that arm. The Schools of Instruction play no direct part in the recruit training, but in the case of the schools belonging to the Services under the control of the Quarter-Master-General they are usually closely associated administratively with the basic training organisation. A characteristic feature of all present-day schools is the number of different nationalities that are to be seen at them. Whenever possible the Dominion and Allied students do the same courses as the British, but on some occasions special courses have to be organised, and there have been two examples of courses being organised specially for a particular Allied country to meet a specific requirement.

Functional schools may be either inter-Service or confined to the Army. The inter-Service schools normally come under the Ministry of Defence, but with few exceptions responsibility for them is delegated to the major user Ministry.

The Imperial Defence College and the Joint Services Staff College, which are concerned with the higher education of officers of all Services, including the Civil and Foreign Services, come directly under the Ministry of Defence.

The School of Land/Air Warfare is run by the Air Ministry. It trains specialists, such as Army liaison officers, and it educates by instructing in the technique of Air cum Land operations of all types.

The Joint School of Chemical Warfare is run by the Army. Whilst its primary job is to train instructors for the Army and Air Force, it also trains specialists. This school played a large part in developing the Civil Defence doctrine.

The Staff College at Camberley is an example of a single function Army

(as opposed to inter-Service) school. The British Army does not countenance the professional staff officer, but takes the view that staff training is part of an officer's professional education, and that employment on the staff must alternate with command of troops. Competition for vacancies on the course is naturally very keen. Candidates are required to pass a qualifying examination, before final selection is made by a War Office Board. The course lasts a year, and is the most widely attended of all by Commonwealth and Allied students. This international characteristic applies also to the directing staff. The Military College of Science runs a parallel course to that at Camberley but in the technical field. The importance of this course has increased steadily. The requirement for technically qualified officers, who are also experienced regimental soldiers, tends to increase year by year.

The Army Mechanical Transport School, which serves the whole Army, is an example of a school which is only concerned with training instructors. It caters rather more for N.C.Os. than for officers.

The five great arms schools—Royal Armoured Corps Centre at Bovington; the School of Artillery at Larkhill with its derivations for anti-aircraft and coast defence; the School of Military Engineering at Chatham; the School of Signals at Catterick, and the School of Infantry at Warminster are similar in function and run a variety of courses for their own arms. Of these only the Tactical Wing of the School of Infantry need be mentioned in detail—for two reasons. First, it is the one school in the Army which has been permitted to break away from the concept that tactical training is the prerogative of the Commander and to conduct purely tactical courses. Whilst the Company Commanders' tactical course is designed primarily for Infantry officers, it is also attended by representatives of the other arms. Secondly, it demonstrates the tactical link-up and relationship between schools. The School of Infantry deals with the tactical employment of the platoon and of the company within the battalion supported by other arms. The next tactical level, that of a battalion within the Brigade Group of all arms, is taught at the Senior Officers School. The Staff College deals with the brigade as part of the division.

The three service schools—R.A.S.C., Ordnance, and R.E.M.E.—fulfil similar functions for their Arms, but are different in that they are administratively closely linked with their basic training units.

The final type example is the Army School of Health. This school is run by the R.A.M.C.; but trains specialist personnel and instructors for all units of the Army. It is, in fact, a combination of an arm and a functional school.

CONCLUSION

It is necessary for a serving staff officer when writing for open publication to state facts. Such opinions as have been expressed are those of officers whose position qualifies them to do so. In the course of his duties the writer has learnt something of the training system and methods of other Armies and has studied one at first hand. He therefore feels that he would not be out of order if he recorded the salient impression which has been made upon his mind. The British system of training, taken all round, has no equal.

“ITER”

CHAPTER XXIV

TANK WARFARE—AND ITS FUTURE

"Tanks are no longer a menace."

"We have too much armour—tanks are finished."

"It may well be that tank warfare as we have known it will soon be obsolete."

THESE THREE authoritative views, taken from a long list of similar kind, were expressed at wide intervals during the last quarter of a century.

The first statement was made at a press conference in 1928, at the time when the disbandment of the British Army's "Experimental Armoured Force," the first in the world, was announced. Some of Germany's soldiers, however, were quick to grasp the offensive potentialities of that new kind of mobile force, and hastened to develop such forces with Hitler's backing when he came into power. In 1940 they shattered the defence of the West, producing the fall of France, while only the sea-barrier saved Britain from defeat by her own weapon.

The second statement quoted was made by Mr. Winston Churchill in February 1944. It was the more remarkable because he had been the godparent of the tank in the World War I, and then seen it exploited by the Germans at the start of World War II with such startling success that he had been taken aback. Yet early in 1944 he had been convinced by his official advisers that the tank was "finished." A few months later Patton's tanks, breaking out from Normandy, swept through France like a torrent, repeating the tank drive of 1940 in the reverse direction.

The third statement quoted was made in America, by the Secretary of the Army, only a few weeks before the outbreak of war in Korea. Mr. Pace cannot be blamed for reflecting the opinion of his expert advisers. Many of the top-level soldiers had been too ready—like the French and British military chiefs ten years before—to assume that the tank menace had been mastered. Their anticipations were fostered by the scientists. Too much faith was based on new weapons that were not yet proved, nor even in production.

Never has there been a more chronic case of military myopia than that which has dimmed the soldier's vision where the tank is concerned. It is a matter of old history how those who sat in the seats of authority failed to recognise the potentialities of such a fighting machine, until it was forced on them from outside, in World War I. Since then, for thirty years the professional pontiffs have repeatedly declared "the tank is dead," and as often been caught napping by the way it rose from the grave to which they had consigned it.

A fresh example was provided by the North Korean invasion of South Korea in June 1950. The rapid opening success of the invaders was due primarily to the shattering effect of a mere four battalions of Korean-manned Russian tanks, numbering only some 200 machines. South Korea had almost as many men as the invaders, but her forces could not withstand that small number of fighting machines. The American troops

who first arrived to reinforce the defence also found the menace of this handful of tanks far more formidable than they had been led to expect. So great was the impression made by the North Koreans' tanks that not only their number but their size was much exaggerated—as in the case of the German invasion of France ten summers before. Correspondents at the front in Korea reported that the invaders were using "sixty-ton tanks," thus giving rise to the idea that Soviet Russia had provided her satellites with the J.S.III—the latest known model of the "Joseph Stalin" heavy tank. In reality, the attack was delivered with nothing more powerful than 30-ton T.34's, a type which made its battlefield debut back in 1941. It was still good enough to beat the kind of defence and the anti-tank weapons it met. No less significant was the fact that the North Korean drive for Pusan only lost its impetus when its tanks dwindled away from lack of replacements. After the crossing of the Nakdong river the North Korean offensive was continued almost entirely by a series of massed infantry attacks; and these failed badly. Thus time was gained for the arrival of more American reinforcements equipped with M.26 and M.46 ("Pershing" and "Patton") tanks that were capable of countering the T.34. The United Nations' counter-offensive only became possible when the balance of tank superiority had changed.

In the subsequent stage of the Korean campaign tanks played a lesser role. That was due in part to the lack of a definite technical superiority in tanks on either side; in part to the fact that ground conditions worsened as winter approached. But it was also due to the way that tanks have been used—in little packets, as mere aids to the infantry. That is the old-fashioned way, dating back to World War I, and it cannot produce decisive results. The Eastern forces have never learned to advance beyond it. The Western forces seem to have forgotten the more advanced technique—and, consequently, to have lost opportunities of making their counter-offensive quickly decisive while the North Koreans were shaken and without tank reinforcements.

Here it is worth mentioning the view of an American officer serving in Korea who has much knowledge of armoured warfare. He remarked:

Tanks have been used primarily in this war to spearhead and support infantry units—and it is my personal opinion that tanks could have been more wisely used than they have been. When you have medium tanks and your enemy has nothing more than small arms, automatic weapons, and mortars there is no reason why your tanks can't penetrate enemy territory on fast raids and raise the devil. This has not been done in this war, but in my opinion it should have been. And your theory that we should put more punch in the forward elements of our armoured units, and eliminate some of the endless trains that support combat armoured units, is the answer, in my opinion, to modern warfare.

Over Western Europe lies the threat of invasion by a mass of Russian armoured divisions. Of Russia's 175 active divisions it is estimated that 55 are "tank" or "mechanised" divisions—which are nearly as strong in tanks (about 80 per cent.) as the "tank divisions." More ominous still, the bulk of the divisions in occupied territory are now of such armoured types. There are known to be at least 25 of these that are stationed well forward and could advance at short notice. That represents an initial striking force of nearly 6,000 tanks—an avalanche of armour compared with the trickle that descended on South Korea. As there can be little hope of matching

the Russian tanks in quantity for a long time, while even a Western superiority in quality of tanks is dubious, it becomes all the more vital to meet the threat with superior tactics. Such a tactical superiority can count for a lot. In 1940 the German tanks were neither as numerous nor as powerful as the French tanks, yet they shattered the French armies and overran France within a few weeks. In 1941 the German tanks were greatly inferior in number to the Russian tanks, yet they destroyed the bulk of these and had almost liquidated Russia's original armies when winter intervened. In each case they won because they knew how to handle tanks in large formations while their opponents did not.

There was, and is, a vital difference between "tank warfare" and "warfare with tanks." The two are too often confused, by military professionals as well as the public. To understand the difference we must go back and trace the tank story from its beginning.

The tank made its first appearance in war on September 15, 1916, in the British offensive on the Somme. It had been devised as a solution of the stalemate produced by the deadly effect of the opposing armies to take shelter in trenches. Once that happened, the war had become stagnant. The customary forms of attack proved futile to overcome the advantage of a well-entrenched defender, and repeated attempts to break through the bullet-swept zone of machine-gun fire failed with ever-mounting loss.

The French suffered worst of all, since they were striving to eject the German invader from the portion of France he had occupied in his first onrush, before the deadlock developed. In their 1915 series of attacks by massed waves of infantry they incurred a physical and moral cost from which they never recovered during the war or subsequently.

A key to the deadlock was found in the combination of armour, the caterpillar track, the petrol engine, and a gun. It was conceived and developed in Britain by the converging thought and efforts of several progressive minds, particularly Colonel Ernest Swinton and Commodore Murray Sueter, while it owed much in the earliest stage to the imaginative support of Mr. Winston Churchill, who was then head of the Admiralty and started experiments when the Army hung back. Sueter visualised cross-country operations by "landships"—a picture already painted in the prophetic short story that H. G. Wells had published in 1903. Swinton concentrated on the immediate problem of breaching the enemy's defences, and had the more direct influence on the armoured fighting vehicle evolved for that purpose. He proposed that the Holt tractor should be taken as a basis—and in this way an American agricultural machine helped to provide the solution for the deadlock caused by the machine-gun, which had been developed by another American inventor, Hiram Maxim.

The actual design of the new "armoured machine-gun destroyer" was done by Mr. William Tritton and Lieutenant Walter G. Wilson. The prototype was produced towards the end of 1915. On January 16, 1916, it had its first run in the yard of the factory at Lincoln where it was built. First "crawl" would be a more accurate term, for it could only move at 2 m.p.h., and even its improved successors had a maximum speed of less than 4 m.p.h. That sufficed for its infantry-accompanying purpose. At the end of January it was taken by rail under a tarpaulin cover to a secret testing ground in Hatfield Park, Lord Salisbury's estate near London. Prior to that journey it was given a new name to conceal its nature

from people who might see it in transit. Seeking one that would reveal nothing yet plausibly fit its tarpaulined shape, Swinton considered such names as "cistern" and "container" and then decided on "tank"—which was both simple and ambiguous. In that way a familiar word gained a new meaning in the English language.

On their battlefield debut, in the Somme offensive, the tanks fell short of fulfilling the hopes that had been pinned to them. That was due to the way that the High Command, contrary to Swinton's advice, chose to hurry a handful into action before "teething troubles" had been overcome and the crews fully trained. But on November 20, 1917, when 380 were launched by surprise against the Hindenburg Line near Cambrai, they smashed a big hole in it—a foreshadowing of greater successes the following year.

Meantime the French had, independently, developed a similar kind of trench-storming machine, which they called a "*char d'assaut*." It was later in development than the British, owing to the difficulty which the initiator, Colonel Estienne, met in convincing the French military chiefs of its potential value. The first battlefield trial in 1917 proved a disappointment, but the French subsequently developed machines of a small but reliable type, the Renault, and these played a leading part in the Marne counterstroke of July 1918 that turned the tide of the war. Then on August 8 another surprise attack near Amiens, led by 460 British tanks, produced what Ludendorff called "the black day of the German Army." It was followed by fresh punches which caused him to declare that the tank was Germany's "most dangerous enemy." But although each of the tank-aided assaults made a deep crack in the enemy's front, his defence was never completely broken through. The tanks were too slow to exploit it, the horsed cavalry too vulnerable, the infantry too slow and too vulnerable. So the results of a victory were never decisive.

Soon after the war, however, much faster types of tank were developed in England—in response to a new conception that was generated there. It was a vision of "tank warfare," not merely of "warfare with tanks." To understand its meaning and its significance, we must trace the story back further than the advent of the tank—to the pre-tank era of warfare, and even back into the mists of antiquity.

The weapon that has come to be known as a "tank" was a novelty in two of its principal ingredients—the caterpillar track and the gasoline motor. The problem for which it was devised had also a partial novelty—the defensive combination of trenches, barbed wire entanglements, and machine-guns that swept the approaches with a stream of bullets. But fundamentally it was only an intensified variation of a very old problem, while the tank of World War I was only a modernised adaptation of the old solution. That tank corresponded to the combination of devices like the battering ram, the catapult, the testudo, and the movable tower, which had been used to breach the walls of fortresses in the ancient world.

The fast types of tank developed after World War I were essentially different in the idea that inspired their production, yet also corresponded to an old idea. They had some affinity with the chariots and elephants that were used in ancient warfare to produce disorder in the enemy's battle-array. But they were still more closely related to the armour-clad horsemen who had constituted the principal striking arm of armies during the

ages when wars were most decisive. Fast tanks were, indeed, intended to resurrect the golden age of cavalry supremacy, by giving "mounted" troops a modern form of offensive mobility. They should thus, it was thought, be able to convert a breach into a complete break-through—because they could exploit any disorder more rapidly than the opponent could rally, and drive through a gap before he could cement it. An extension of this new concept was that such fast armoured forces would be able to operate *strategically*, independently of the main army, carrying out a long-range drive to cut the enemy's communications far back, where his main arteries of supply could be severed. Thus his whole army, and power of resistance, might be paralysed.

As I was instrumental in developing the idea of tanks as reborn cavalry, and particularly its *strategic* extension, it may be of interest to relate how this developed. It came to my mind initially from studying the long-sustained drives carried out by Genghis Khan's all-mobile forces in the thirteenth century, when the Mongols first swept eastward over China and then turned westward to overrun not only the Middle East but the eastern half of Europe. The concept of modernised "mongol" operations was made a keynote in the training of Britain's first experimental armoured force, and also caught the imagination of General MacArthur, who emphasised it in his 1935 report as Chief of Staff of the U.S. Army. But I came to see more clearly its applications against modern mass armies, dependent on railroads for supply, as a result of studying the Western campaigns of the American Civil War for my book on Sherman in 1929. A blend of the lessons of Sherman's march through Georgia and the Carolinas, which cut off Lee's supplies, and of Forrest's hamstringing raids on the other side provided a basis in working out the technique of "deep strategic penetration" for armoured forces.

The subsequent history of the tank has been a story of the prolonged struggle between the original conception of the tank as an aid to the infantry assault and the newer conception of it as an independent mobile arm. They may be called, for shortness, the "battering ram" idea and the "reborn cavalry" idea. Each of them has undergone some modification—for example, the first school of thought have come to recognise the value of speedier tanks in aiding the infantry, despite the increased difficulties of close co-operation, while the second school have come to accept the necessity of including a mobile infantry element in the armoured formation as an aid to the tanks in overcoming obstacles. But these are only modifications and do not represent any fundamental change in the two ideas—which are basically different and inherently opposed.

There is no distinctively "national" doctrines of tank employment—German, Russian, American, etc. The two basic ideas run through all of them like seams of contrasting colour. The only value of examining the national doctrines separately lies in seeing how far one or the other basic idea has predominated, and what the results have been.

In the years following World War I the French Army remained the strongest in the world apart from the Russian, and retained the largest number of tanks. It also maintained the "battering ram" idea as the basis of its tank doctrine, and its tank units formed part of the infantry arm. The example of the French naturally influenced most of the other armies

in Europe and elsewhere. The United States Army followed the French line, and although in 1938 it tried an experimental armoured force similar to the British, it soon dropped the experiment; only at a later stage did it swing back to that new direction and turn its cavalry into "armoured cavalry."

The British Army in its post-war pattern started with the advantage that its tanks were organised in a separate corps, as an additional arm, distinct from both the infantry and the horsed cavalry. That was a great help in developing a new idea, unfettered by old habits and traditions. By taking the technical lead in producing tanks with a speed of 20–30 m.p.h. it also gained the power of being able to demonstrate the new tactical theories in a practical way. Thus by the mid-1920's the General Staff were persuaded to adopt these as their tank doctrine. Nevertheless, the infantry pressed for tank support, and in the 1930's the British General Staff, acceding to the demand, ruled that the Tank Corps must provide battalions of special "I" tanks to work with the infantry while sharing the mobile armoured division role with cavalry units converted for the purpose. This meant that Britain's limited tank strength was spread too thinly. It also meant that too many senior officers who did not understand tanks were brought in to handle them and direct policy.

The German Army had not been allowed to have tanks under the Versailles Peace Treaty. Thus, in contrast to the French, it was unencumbered either by a stock of old tanks or by an old doctrine when Hitler gained power in 1933 and provided it with the opportunity of re-equipping itself. Meantime the leading German officers had watched foreign trends attentively, and they embraced the post-war British idea in preference to the French. They gained Hitler's backing for their preference, which offered the greater offensive possibilities. So the German Army concentrated on creating armoured divisions, and wasted no effort on tank support for the infantry. By 1940 it produced ten divisions of this new type, and although these were only a small fraction of the German Army they broke through the French front and virtually decided the campaign in the West before the bulk of the infantry divisions appeared on the scene.

In the last few years before the war the French had begun to form a few divisions of the same old type, but the Higher Command was unable to shake itself free of the old idea and tended to disperse these divisions while still allotting a large proportion of its tanks to the direct support of the infantry. Thus the Germans found it easy to destroy them piecemeal or bypass them. The effect was the more fatal because Guderian—the chief trainer of the German armoured forces, who now led the break-through—had enthusiastically adopted the idea of "deep strategic penetration." His application of it paralysed the French Army and produced a quick collapse.*

The same thing happened the next year, 1941, when the Germans invaded Russia. The Soviet hierarchy had recognised the importance of tanks sufficiently well to furnish the Red Army with them in huge numbers. Its tank troops, however, had neither the skill nor the radio equipment

* It may be recalled that General Guderian has described himself as "Liddell-Hart's disciple" and stated that "Liddell-Hart was my first teacher in tank tactics," sentiments which he has repeated in his recently published book.—Ed.

required for controlled manœuvre in large formations, and most of the tanks were distributed in packets for the support of the infantry. Thus they were easily overcome by the concentrated blows of the German armoured formations. But the vast space of Russia in combination with mud came to the rescue of the Russians in the autumn, and again in 1942, so that they gained time to develop an improved anti-tank technique as well as a better tank force.

In North Africa a single British armoured division used on the new lines was the main factor in liquidating an Italian army twenty times its size during the winter of 1940–41. But then the tables were turned by the arrival of Rommel, who was not only a master of offensive tank warfare but the first general to demonstrate the defensive potentialities of the skilful combination of tanks and anti-tank guns. He showed how an enemy tank force could be destroyed by luring it into traps—thus clearing the path for his own tank *riposte* deep into the enemy's back areas.

This was an important turning-point in tank warfare. The tank had been devised in World War I as a purely offensive weapon, and had long continued to be regarded only in that light. When the British tried to use it defensively in meeting the German offensive of March 1918 it was ineffective. Because of the slow speed of the tanks they were laid out in a chain of little packets spread along the back of the front, so that they were unable to deliver a strong counterstroke at any point. Many of them fell into the enemy's hands through running out of petrol when trying to make a lengthy switch or withdrawal. The same thing happened to the French in meeting the German offensive of 1940 when they practised the same kind of distribution—their tanks were rarely at the right spot, and if they were it was in such small numbers that they were overwhelmed by the concentrated onslaught of the German tanks. The French had not thought out the problem of employing tanks in defence, and had not developed a new defensive technique such as was required. It was left to Rommel to prove its value.

The demonstration, however, had cramping effects on the development of tank warfare—and the more so because, as tank output was growing, the balance of superiority was shifting to the Allied side. Few of the commanders on that side had learned the art of handling tanks in large formations, and they tended to use their increasing volume of tanks in a multiplicity of small tank-fights, seeking to wear down the enemy's strength by an attrition process based on their own growing superiority of numbers. They could afford to lose two or three tanks for one of the enemy if the attrition exhausted the Germans' scantier resources. The tendency was accentuated both by the infantry's constant cry for tank support and by the tank crew's cry for bigger and bigger tank-guns. The less confidence these had in their own skill of manœuvre, the more they clamoured for a decisively powerful gun as well as thicker armour. So the tank itself grew bigger and heavier, while dwindling in manœuvreable number. At the same time tank tactics reverted from the 1920–40 concept to the primitive 1914 concept. The Germans contributed to the tendency by producing the 56-ton "Tiger," and then the 67-ton "Royal Tiger." These monsters were too slow and cumbersome for exploiting an offensive into a rapid and deep break-through, but they appeared at a time when a weakening German Army was being forced on the defensive, and

in defence they were a very formidable deterrent to attacking tanks that tried to penetrate the German front.

The compound effect of these factors was that in the later stages of the war tank-battles declined into gun-duels between individual tanks or small units. The few exceptions to the rule occurred when the German tank-strength was temporarily reduced to a shadow—as it was on the eve of the Allied break-out from Normandy. But most of the later battles were serial slogging matches, in which quickness of shooting by the individual tanks counted for much more than the quickness of formation manœuvre.

There things remain. The 1950 tank operations in Korea followed the same pattern—if, indeed, tank fighting that was so shapeless can be described as having a “pattern,” or as “operations” in the true sense. They provided a renewed demonstration of the importance of “tanks in warfare,” but not of “tank warfare.” It is worth note that the North Korean tanks were not used in the “strategical” style that the Germans adopted in launching their invasions—deep penetration by independent armoured forces racing ahead of the rest of the army. The North Korean tank advance appears to have been in the “tactical” style normally followed by the Soviet Army, and others, in the middle and later period of the last war—limited bounds by little packets in close co-operation with the infantry. The North Koreans’ scarcity of mechanised troops, to make up the armoured team, would naturally impose such limited methods. Despite the surprise and ease of their opening advance, they penetrated barely fifty miles in the first week. The Germans’ 1941 tank advance into Russia penetrated as far as that on the first day, and over 200 miles in the first week. If the North Koreans had been able to operate in Guderian style they would have overrun the whole of South Korea before the U.S. reinforcements had arrived on the scene.

What of the future? The only conclusion that has any certainty is that the tank will not have a future equal to its past unless there is a return from the “battering ram” idea to the “reborn cavalry” or “mongol” idea. We are not justified in regarding such a return as impracticable until we have explored the possibilities of a new step forward in the design of tanks and of tank formations. The most experienced tank generals of the German Army, which took the lead in mounting bigger guns in tanks, came to the conclusion that manœuvrability is even more important—for quickness in changing fire-positions and shortening the range, to obtain more effective fire. This judgment is the more significant because of their exceptionally wide range of experience, not least in fighting against Russian tank forces. They consider armour as relatively less important than hitting power and manœuvrability.

It is time for a reversal of the “elephantine” trend of tank design. The tank of the future will need to be fitted with night driving vision, and probably with radar. It should also be able to pass safely over a radio-active stretch of ground. If these fresh requirements are to be combined with a heavy gun and over-all armour, the tank is bound to develop into an increasingly clumsy monster. Design must be simplified—towards producing a mechanical David instead of a Goliath. One possible way is by external mounting of the main weapon—which should be sighted, fired, and fed with munition mechanically. The armoured body could then be quite small—a cabin to house the directing apparatus and a crew

of not more than three men. Much might be gained by the development of a new and lighter form of hard-hitting weapon, of rocket-launcher or recoilless gun type. Much weight, too, might be saved by the development of a new form of motive-power—such as the application of hydrogen peroxide propulsion adopted in the revolutionary type of submarine designed in Germany by Dr. Walther late in the war.

The right balance between *numbers* and *power* (concentrated in a single machine) is not easy to reach. But in history the tactics of the Mongol armies, and also of the Byzantines at their best, tended to show that a combination was superior to relying on one or other factor alone. Besides the tactical question there is the economic consideration that governments are very unlikely to provide the highly expensive tank of 50–70 tons in anything like the quantity that is needed.

There is also much scope for progress in organisation. The armoured forces that were regarded as so unorthodox in 1940 are now conventional. The post-war armies of the Western powers merely continue the same pattern. They need to be remodelled if they are to avoid being paralysed by air attack. For they cannot expect to enjoy their immense advantage in 1944–45 of moving under a vast air umbrella against an opponent who was almost devoid of such cover overhead. In manœuvring against an invading host they must reckon with very serious interference from the Soviet Air Force—which could employ thousands of attacking planes, where they can only count their own air support in hundreds. Moreover, because of relatively greater supply needs, Western armies are more susceptible to paralysis than armies of Soviet type.

Since the Western powers are faced by opposing armies of greatly superior size, their chance of successful resistance vitally depends on being so mobile, both strategically and tactically, that they can out-manœuvre the attacker. It is not only a matter of the small armoured units having the utmost possible battlefield agility, so that they can shift quickly from one fire-position to another, but of divisions being able to switch rapidly from one sector to another to deliver deep “in-and-out” counterstrokes, with the aim of hamstringing the invader. That calls for a new kind of organisation. The armoured divisions that proved so decisive in 1940 had gone less than half-way towards fulfilling the design I had visualised in 1920. Every vehicle in the armoured division should have cross-country mobility and at least sufficient protective armour to keep out bullets and shell-splinters. The present-type armoured division is gravely lacking in manœuvring flexibility. Its long road-bound tail makes it almost as rigid as the shaft of a spear. We ought to develop it into a mechanical snake.

We must also cut down the size of the tail. The most deadly effect of a tank stroke comes from the sudden concentration of a mass of tanks at a weak spot. But with the present bulky organisation it is difficult to concentrate the tank-heads of several divisions on a narrow sector, and even more difficult to concentrate them quickly. To make it more practicable it is essential to reduce the auxiliary components of the division, thus increasing the tank ratio.

The tactical idea which inspired the creation of armoured forces was that of *fighting mounted*—to gain mobility and maintain momentum—as the cavalry did in the times when they were the decisive instrument

of battle. The incorporation of men who can fight on foot is a tactical necessity—for ferreting out enemy troops who are under cover behind obstacles, and for various defensive duties. But it is a basic error of organisation if the proportion of such “mounted infantry,” who dismount to fight exceeds or even equals the proportion that fights mounted, manning tanks and self-propelled guns.

Moreover, the mounted infantry element should have a cross-country mobility about equal to that of the armoured fighting element. That condition requires full-tracked and lightly armoured vehicles. Otherwise they will not be able to back up the tanks closely—to clear defended obstacles that are blocking the tanks. War experience tends to show that the quicker these foot-fighters can intervene the fewer will be needed. A company of “tank-marines,” true armoured infantry, coming into action immediately they are needed might brush away resistance that a whole battalion of ordinary motorised infantry, brought up later, could not overcome when the obstacle has been reinforced. Time is decisive in war.

The existing armoured division contains four infantry battalions and four tank regiments. Four companies of “tank-marines”—one for each tank regiment—would be a better standard on balance. If and when more infantry support is required a motorised division could be brought up. The supply requirements of the division must be diminished if adequate mobility is to be attained. Armoured forces must learn to move “light” and rid themselves of impedimenta as ruthlessly as Sherman did in order to make his marching forces mobile. We need another Sherman to slim and streamline the present armoured forces. They must be capable of operating self-contained for several days, or even weeks, instead of being tied to lines of communication. Airborne supply could be of great help. If we can solve the problem of designing a light tank with a highly effective armour-piercing weapon it should be possible to form armoured divisions that can be carried complete by air. Such divisions, dropped in Russia’s back areas near the Caspian sea, might play havoc among her vital war-supply sources, particularly if used to exploit the confusion caused by strategic air attack.

In organisation as in tank design there are many possibilities still undeveloped by which the power of armoured forces may be not only maintained but extended—to create a new revolution in warfare. Given such fully mobile forces the Western powers should be able to make rings round the Soviet army as at present organised. But if the Russians were to develop such forces and we had not done so a disaster worse than 1940 would befall us.

Hitherto Russian tank tactics have not advanced beyond the “battering ram” idea, and if Korea be a guide they still seem to be wedded to the method of close co-operation with infantry. It would be unwise to discount the possibility that they have a different technique in mind in case Stalin decides to invade the West, but lack of experience in true “tank warfare” may be a check on its development by them. The Western powers have the greater capacity for a fresh technical and tactical jump if their military leaders have the imagination and vision.

Before Korea many infantrymen were arguing that the new bazooka would keep any tank at bay, while many airmen declared that they were now able to stop any advancing body of tanks. Experience has refuted

both these cherishes hopes. I doubt whether the bazooka can be really decisive as a "tank-killer" unless its effective range can be trebled or quadrupled—and that will be hard to attain. If it be eventually attained, it may destroy the value of armour, but not the value of fast cross-country striking power, which forms the more basic value of the tank.

A greater prospect of nullifying the tank may lie in the development of atomic weapons suitable for tactical use, or of a new chemical weapon that can penetrate any protection. But the Western powers have a greater chance than Russia of being the first to produce such weapons—and if they are produced they would create a great opportunity for the use of the suggested new-pattern armoured force. It could exploit the enemy's paralysis far better than any present army could.

B. H. LIDDELL-HART

CHAPTER XXV

THE ROYAL AIR FORCE. ORGANISATION AND ROLE

THE AIR COUNCIL AND THE AIR MINISTRY

THE AIR COUNCIL administers the Royal Air Force through the machinery of the Air Ministry, which derives its authority from Parliament.

The President of the Air Council is the Secretary of State for Air, and the administrative business of the Air Ministry is dealt with by four Departments, three of which—Air Staff, Personnel, and Supply and Organisation—are under Air Members of the Council, and the fourth under the Permanent Under-Secretary of State for Air. The Vice-President of the Air Council is the Parliamentary Under-Secretary of State for Air, and there are three additional Air Members, the Vice-Chief of the Air Staff, the Deputy Chief of the Air Staff, and the Controller of Supplies (Air). The latter is an official of the Ministry of Supply, and serves as an additional Member of the Air Council in order to provide a high-level connecting link between the two Ministries in regard to the operational requirements of the Royal Air Force.

There are therefore nine Members in all of the Air Council, and the actual composition as at April 1, 1951, is given on page .

The Control and administration of the Air Force is exercised mainly through the three Departments that are under Air Members of the Air Council, and instructions to Commands are normally issued by these Departments. The Department of the Permanent Under-Secretary of State for Air is responsible for the conduct of official business, including the administration of the secretarial staff, for financial matters, and for the control of the civilian establishment of the Air Ministry and the Air Force.

Following the recommendation of a committee presided over by Mr. A. J. Quig, which reviewed the organisation of the Air Ministry, the former Department of the Air Member for Technical Services was combined on February 1, 1951, with that of the Air Member for Supply and Organisation, who thus became responsible for the Technical Services (repair, maintenance, and technical training) in addition to his existing responsibilities for organisation, works, and equipment. He is assisted by a Controller of Engineering and Equipment, with the rank of Air Marshal, who is responsible for directing and co-ordinating the functions of the Directors-General of Technical Services and Equipment.

Many officers in the Royal Air Force will think that this is a step in the right direction, and that the centralisation of the control of the technical services and equipment was a necessary reform which was long overdue. It does, however, mean that there is an important difference between the staff organisation at Air Ministry level and at Command level and below. From Command level downwards the staff is organised in three branches, the Air Staff, the Administrative Staff, and the Technical Staff, popularly known as the "three-pronged" organisation. The Administrative and

Technical Staffs now receive guidance and instructions from one Department (that of Supply and Organisation), whilst on personnel matters the Administrative Staff looks for guidance to the Department for Personnel. There seems no reason, however, why this apparently somewhat complicated organisation should not work well in practice.

INSPECTORATE-GENERAL OF THE ROYAL AIR FORCE

Location: Tenterden Grove, Hendon, N.W.4.

Inspector-General: Air Chief Marshal Sir James M. Robb, G.C.B., K.B.E., D.S.O., D.F.C., A.F.C.

Role: Undertakes visits and inspections, and investigates problems requiring special examination, on behalf of the Chief of the Air Staff. He is assisted by a small staff, including an Inspector of W.R.A.F.

COMMAND ORGANISATION

The Royal Air Force is organised in Commands, of which there are eight at home and three overseas. The home Commands are Bomber Command, Coastal Command, Fighter Command, Flying Training Command, Home Command, Maintenance Command, Technical Training Command, and Transport Command. The overseas Commands are British Air Forces of Occupation (Germany), the Middle East Air Force, and the Far East Air Force. In addition No. 90 Group at home and the Rhodesian Air Training Group have a status equivalent to that of a Command, although the latter receives its policy direction from Flying Training Command.

The home Commands are organised on a functional basis and the overseas Commands on a geographical basis. Under the Commands there are Groups (usually called Air Headquarters overseas), and the Groups are organised in Stations on which the squadrons or other units are located.

The head of each Branch of the Staff of a Command or Group reports direct to the Commander, and not, as is the practice in some other Services, through a Chief of Staff.

BOMBER COMMAND

Location: High Wycombe, Buckinghamshire.

Air Officer Commanding-in-Chief: Air Chief Marshal Sir Hugh P. Lloyd, K.B.E., C.B., M.C., D.F.C.

Lower Formations: No. 1 Group, Bawtry, Doncaster, Yorkshire.

No. 3 Group, Mildenhall, Bury St. Edmunds, Suffolk.

Aircraft: Washington (B.29), Lincoln B.2, Mosquito 5B.3 and PR.34, Meteor PR.10, Lancaster PR.1.

Role: Bomber Command is the main striking arm of the Royal Air Force. The squadrons are equipped with Washingtons (the B.29's delivered from America during 1950 under the Military Assistance Programme) and Lincolns, together with Mosquitoes for marker operations. On

March 8, 1950, the last bomber Lancaster left the Command, although some are still retained for photographic reconnaissance duties. The Lancaster was the predominant aircraft in Bomber Command during the war, and as such played a major part in the defeat of Germany.

The Command is also responsible for photographic reconnaissance, and for the administration of the majority of the stations occupied in this country by the United States Air Force.

During 1951 the first squadrons should be equipped with the Canberra, the twin-engined jet bomber now in production, which will be the interim type pending the introduction of a four-engined jet bomber.

COASTAL COMMAND

Location: Northwood, Middlesex.

Air Officer Commanding-in-Chief: Air Marshal Sir Charles R. Steele, K.C.B., D.F.C.

Lower Formations: No. 18 Group, Pitreavie Castle, Dunfermline, Fife.
No. 19 Group, Mount Batten, Plymouth, Devonshire.
R.A.F., Gibraltar.

Aircraft: Lancaster GR.3, Sunderland GR.5, Halifax Met.6, Hastings Met.1.

Role: Coastal Command is responsible for the provision of aircraft for maritime operations, which are operated in accordance with naval requirements through Area Combined Headquarters located with each lower formation and the corresponding Naval Command. The primary role is anti-submarine warfare, but the Command is also responsible for meteorological reconnaissance and air search and rescue. Some expansion of the Command is taking place under the defence programme.

FIGHTER COMMAND

Location: Bentley Priory, Stanmore, Middlesex.

Air Officer Commanding-in-Chief: Air Marshal Sir Basil E. Embry, K.B.E., C.B., D.S.O., D.F.C., A.F.C.

Lower Formations: No. 11 Group, Hillingdon, Middlesex.
No. 12 Group, Newton, Nottinghamshire.

Aircraft: Vampire F.1, F.3, and FB.5, Meteor F.3, F.4, and F.8, Hornet F.3, Mosquito NF.30 and NF.36, Spitfire LF.16, F.21, and F.22, Auster 6, Hoverfly 2.

Role: The Command is responsible for the defence of the United Kingdom from air attack, and under the defence programme priority is being given to the expansion of our fighter force, including night fighters. The anti-aircraft forces allocated to home defence under Anti-Aircraft Command are under the operational control of Fighter Command, which also controls the Royal Observer Corps and the radar network around the British coastline.

To assist in the co-ordination of all the elements necessary for air defence the 20 fighter squadrons of the Royal Auxiliary Air Force were transferred

to Fighter Command at the end of 1949, and the Fighter Control Units, which are also auxiliary units, were similarly transferred at the end of 1950 and early in 1951.

The Venom will start to replace the Vampire, and the Meteor NF.11 the Mosquito, during 1951, and all squadrons, including those of the Royal Auxiliary Air Force, should be re-armed with jet aircraft by the end of the year. Consideration is also being given to the possibility of obtaining F.86 (Sabre) aircraft from America.

FLYING TRAINING COMMAND

Location : Shinfield Park, Reading, Berkshire.

Air Officer Commanding-in-Chief : Air Marshal Sir Hugh S. P. Walmsley, K.C.I.E., C.B., C.B.E., M.C., D.F.C.

Lower Formations : No. 21 Group, Morton Hall, Swinderby, Lincolnshire.
 No. 23 Group, Leighton Buzzard, Bedfordshire.
 No. 25 Group, Manby, Lincolnshire.
 No. 54 Group.
 Royal Air Force College, Cranwell.
 Royal Air Force Flying College, Manby, Lincolnshire.

Aircraft : Percival Prentice T.1 and Chipmunk T.10 (basic training), Harvard 2.B, Balliol T.2, and Athena T.2 (applied training), Wellington, Mosquito, Meteor, and Vampire (advanced training), Anson (navigator training), Lancaster B.7 and Lincoln B.2 (air gunner and wireless operator training).

Role : The command is responsible for flying training from the basic flying stage up to the flying and handling stage on operational types of aircraft. Operational and tactical training in the use of the aircraft is given in the operational Commands at Operational Conversion Units. The Command is also responsible for the training of flying instructors, for air navigation and air armament training, and for policy supervision of the Rhodesian Air Training Group.

The Royal Air Force College, Cranwell, is the training centre for the regular officers of the Royal Air Force, and the Royal Air Force Flying College gives practical instruction and experience in a combined course of flying, navigation, and the use of weapons in all weather conditions.

HOME COMMAND

Location : White Waltham, Maidenhead, Berkshire.

Air Officer Commanding-in-Chief : Air Marshal Sir Robert M. Foster, K.C.B., C.B.E., D.F.C.

Lower Formations : No. 61 Group, Kenley, Whyteleaf, Surrey.
 No. 62 Group, Rudloe Manor, Chippenham, Wiltshire.
 No. 63 Group, Hawarden, Chester.
 No. 64 Group, Heslington, Yorkshire.
 No. 66 Group, Turnhouse, Edinburgh.
 No. 67 Group, Whiteabbey, Belfast.
 R.A.F. Record Office, Uxbridge, Middlesex.

Aircraft: Tiger Moth and Chipmunk T.10 (Reserve Schools Trainers), Anson, Auster 5 and 6, Valetta C.1.

Role: The Command is responsible for raising, maintaining, and training the Reserve, Auxiliary, and Pre-Entry Forces, and for recruiting for the R.A.F. and W.R.A.F. The operational control of the fighter squadrons and the Fighter Control Units of the Royal Auxiliary Air Force is, however, vested in Fighter Command.

During the year No. 65 Group (London and Middlesex) was disbanded, its functions being absorbed by No. 61 Group, and a new Group, No. 67, was formed in Northern Ireland. The areas covered by all Groups are now equivalent to the Army Command areas, and this also facilitates dealings with the Territorial and Auxiliary Forces Associations.

A number of administrative responsibilities have also been transferred to the Command in order to effect economy and to enable the operational Commands to concentrate more on their primary functions. To indicate the wider role of the Command its title was changed from Reserve Command to Home Command.

Royal Auxiliary Air Force: Consists of squadrons and units on a part-time basis, which are trained to a front-line standard and are intended to take their place in the front line in emergency.

There are:

20 fighter squadrons (in Fighter Command).

26 fighter control units (in Fighter Command).

12 light anti-aircraft squadrons of the R. Aux. Air Force Regiment.

5 air observation post squadrons. These squadrons serve the Territorial Army, from which the pilots are drawn, and the aircraft are maintained by the R. Aux. Air Force.

Transport Squadrons. It was announced in September 1950 that a number of reserve transport squadrons were to be formed from the resources of civil charter firms. These squadrons will be under the operational control of Transport Command.

Royal Air Force Volunteer Reserve: The main reserve from which the Royal Air Force will be manned in an emergency. Flying training is given at Reserve Flying Schools and ground training at Reserve Centres, and in addition personnel undertake fifteen days' annual training.

University Air Squadrons: There are now 17 squadrons, the formation of three new squadrons at Bristol, Hull, and Liverpool having been announced in January 1951. Squadrons are located as follows:

Aberdeen	Belfast	Birmingham	Bristol
Cambridge	Durham	Edinburgh	Glasgow
Hull	Leeds	Liverpool	London
Manchester	Nottingham	Oxford	Southampton
St. Andrews			

The squadrons provide a channel whereby graduates are subsequently recruited.

Air Training Corps: Intended to foster an interest in aviation and to give pre-national service training to youths of 14-18. A scheme was

introduced in 1950 whereby selected Air Training Corps and Combined Cadet Force cadets can be trained at civil flying clubs up to the private pilot's licence standard, the Air Ministry defraying the cost.

MAINTENANCE COMMAND

Location : Amport, Andover, Hampshire.

Air Officer Commanding-in-Chief : Air Marshal Sir Thomas A. Warne-Browne, K.B.E., C.B., D.S.C.

Lower Formations : No. 40 Group, Bicester, Oxfordshire.
No. 41 Group, Andover, Hampshire.
No. 42 Group, Kidlington, Oxfordshire.
No. 43 Group, Hucknall, Nottinghamshire.

Role : The Command is responsible for the receipt from manufacturers, and for the storage and distribution, of all aircraft, equipment, and stores for the Royal Air Force, and for major repairs to aircraft and motor transport.

TECHNICAL TRAINING COMMAND

Location : Brampton, Huntingdonshire.

Air Officer Commanding-in-Chief : Air Marshal Sir John Whitworth Jones, K.C.B., C.B.E.

Lower Formations : No. 22 Group, Market Drayton, Shropshire.
No. 24 Group, Aston Clinton, Aylesbury, Buckinghamshire.
No. 27 Group, Colerne, Chippenham, Wiltshire.
Royal Air Force Technical College, Henlow.

Role : The Command is responsible for all forms of training in ground duties for officers and airmen, including the initial training of recruits, technical training, and the training of apprentices. The Royal Air Force Technical College is intended to give higher technical training, and its work corresponds on the technical side to that of the Royal Air Force Flying College on the flying side.

During the past year certain of the administrative responsibilities of the Command not directly concerned with training were transferred to Home Command, in order that Technical Training Command could concentrate on its primary function of ground training.

TRANSPORT COMMAND

Location : Upavon, Wilts.

Air Officer Commanding-in-Chief : Air Marshal Sir Aubrey B. Ellwood, K.C.B., D.S.C.

Aircraft : York C.1, Dakota C.4, Hastings C.1, Valetta C.1 and C.2.

Role : The Command is responsible for the operation of all transport services for the Royal Air Force in the United Kingdom and Europe and on all long-distance routes between England and the overseas Commands. Transport services within the overseas Commands are the

responsibility of the Command concerned. The Command is also responsible, in co-operation with the Army, for the training of airborne forces in the air aspects of their work, including tactical supply by air and the evacuation of casualties.

When, early in 1950, economies were made in the Services the main reduction as far as the Royal Air Force was concerned fell upon Transport Command. It seems probable that, under the new expansion programme, the main effort will be concentrated upon the operational Commands, and that little or no expansion will take place in Transport Command. Instead, reliance will be placed on our resources of civil aircraft for use in emergency. To this end a number of reserve transport squadrons are being formed from civilian charter companies as part of the Royal Auxiliary Air Force and will come under the operational control of Transport Command.

NO. 90 GROUP

Location : Medmenham, Marlow, Buckinghamshire.

Air Officer Commanding : Air Vice-Marshal W. E. Theak, C.B., C.B.E.

Role : As the greater part of the signals services in the United Kingdom are necessarily common to all Commands, the Group is responsible for providing such services, and is controlled and administered directly by the Air Ministry. The Group therefore has a status equivalent to that of a Command.

BRITISH AIR FORCES OF OCCUPATION (GERMANY)

Location : Bad Eilsen.

Commander-in-Chief : Air Marshal Sir Thomas M. Williams, K.C.B., O.B.E., M.C., D.F.C.

Lower Formation : No. 2 Group.

Aircraft : Vampire FB.5, Meteor FR.9 and PR.10, Mosquito B.35, Auster 6.

Role : As part of the Allied forces of occupation, B.A.F.O. provides the tactical air forces for co-operation with the British and Western Union Armies. New squadrons have been formed as part of our contribution to the North Atlantic Treaty force, and further squadrons will be formed as the expansion programme proceeds.

MIDDLE EAST AIR FORCE

Location : Ismailia, Egypt.

Commander-in-Chief : Air Marshal Sir John W. Baker, K.C.B., M.C., D.F.C.

Lower Formations : No. 205 Group, Fayid, Egypt.

Air Headquarters, Malta.

Air Headquarters, East Africa.

Air Headquarters, Iraq.

Headquarters, British Forces, Aden.

Aircraft: Vampire FB.9, Meteor FR.9, Brigand B.1, Mosquito NF.36 and PR.34, Lancaster GR.3, Valetta C.1, Auster 6.

Role: The Command, in conjunction with the other services, is responsible for the defence of British interests throughout the area, which extends from Malta to Mauripur, where there is a R.A.F. Staging Post near Karachi, and from Greece to East Africa.

The geographical extent of the Command is the biggest in the Royal Air Force, and practically all elements of the Air Force are represented. There are day and night fighter squadrons, tactical squadrons, transport squadrons, maritime squadrons, and a heavy bomber base for the operation of squadrons from Bomber Command, which visit the Command periodically. Some new squadrons have been formed, as the beginning of a considerable increase in strength in the area.

Aden and Iraq differ from other Commands and Formations in that the Air Force Commanders in both places exercise command over any Army troops that may be located there, instead of having the joint system of command in force elsewhere.

FAR EAST AIR FORCE

Location: Changi, Singapore.

Commander-in-Chief: Air Marshal Sir Francis J. Fogarty, K.B.E., C.B., D.F.C., A.F.C.

Lower Formations: Air Headquarters, Ceylon.
Air Headquarters, Malaya.
Air Headquarters, Hong Kong.

Aircraft: Vampire FB.5, Hornet 3, Brigand B.1 and Met.3, Dakota C.4, Valetta C.1, Mosquito PR.34, Spitfire F.18, FR.18, and F.24, Sunderland GR.5, Auster 6.

Role: The Command, in conjunction with the other services, is responsible for the defence of British interests throughout the area, which extends from Ceylon to Hong Kong. The most important task of the Command at the present time is that of assisting the Army and Police in Malaya in the campaign against the terrorists. The Air Force is used mainly for reconnaissance, for direct support, including the provision of striking forces on call when suitable targets have been located by the ground forces, for supply, without which the ground forces could not operate in the jungle, and for the air evacuation of casualties.

RHODESIAN AIR TRAINING GROUP

The Group, which has its Headquarters at Bulawayo, Southern Rhodesia, and which is manned partly by the Rhodesian Air Force, is employed on flying training under the policy supervision of Flying Training Command. This is a continuation of the Empire flying training scheme which proved so successful during the war, and enables the facilities developed then in Rhodesia to be retained in use. The Group is equipped with Anson, Harvard, and Tiger Moth aircraft.

ROYAL AIR FORCE REGIMENT

Commandant General and Inspector of Ground Combat Training: Air Vice-Marshal S. C. Strafford, C.B., C.B.E., D.F.C.

The Regiment was formed in 1942, and its primary responsibility is the local defence of airfields. For this purpose it includes rifle and light anti-aircraft squadrons, and also armoured car squadrons in the Middle East Air Force and British Air Forces of Occupation (Germany). There are also twelve light anti-aircraft squadrons of the Royal Auxiliary Air Force Regiment.

The Regiment is also responsible for the provision of officers and N.C.Os. for locally raised forces in Iraq, Aden, and Malaya, and elsewhere as required, and for the ground combat training of the Royal Air Force as a whole. In order to ensure that in war a nucleus of airmen will be available who have been specially trained in ground combat duties, orderlies who have no technical trade are included in the Regiment and are given special training.

WOMEN'S ROYAL AIR FORCE

Director: Air Commandant N. M. Salmon, O.B.E., A.D.C.

The Women's Royal Air Force replaced the former Women's Auxiliary Air Force on February 1, 1949. It is no longer an auxiliary force but is a regular one, and as such is an integral part of the Royal Air Force, providing women as substitutes for men in a large number of trades and duties.

ROYAL OBSERVER CORPS

Commandant: Air Commodore G. H. Vasse, C.B.E.

The Corps is a part-time volunteer force, with a nucleus of whole-time officers, whose main function it is to keep track of every hostile and friendly aircraft flying over the British Isles. The Corps, as an integral part of the air defence system, is under the operational and administrative control of Fighter Command. The aim is to enrol 28,000 men and women between 16 and 55, but the present strength is about 16,000.

SCHOOLS AND COLLEGES

Certain schools and colleges receive their policy direction from the Air Ministry and not through Commands. These are:

R.A.F. Staff College, Bracknell.

R.A.F. Staff College, Andover.

School of Land/Air Warfare, Old Sarum.

Joint Anti-Submarine School, Londonderry (R.A.F. element).

School of Combined Operations, Fremington, Barnstaple (R.A.F. element).

MINISTRY OF SUPPLY ESTABLISHMENTS

The Royal Air Force plays a major part in manning a number of research and experimental establishments of the Ministry of Supply, under whose policy direction the establishments come. These are:

Aeroplane and Armament Experimental Establishment, Boscombe Down.

Marine Aircraft Experimental Establishment, Felixstowe.

Telecommunications Research Establishment, Flying Unit, Defford.

Armament and Instrument Experimental Unit, Martlesham Heath.

Bombing Trials Unit, West Freugh.

Parachute Test Unit, Henlow.

Aircraft Torpedo Development Unit, Gosport.

In addition, aircrews and technical personnel are provided for the Royal Aircraft Establishment, Farnborough, which also administers certain of the above units, as well as the Empire Test Pilots' School.

W. M. YOOL

CHAPTER XXVI

COMMONWEALTH AIR FORCES

FLYING WAS a new form of adventure which appealed to the pioneering spirit, and from its earliest days has always had a particular attraction for the youth of the Dominions. They joined the Royal Flying Corps in their thousands during the 1914-18 war, and many of those who survived remained on in the Royal Air Force after the war, where they were followed by a constant stream of volunteers from the Dominions.

Because of this strong Dominion element in the Royal Air Force the ties between it and the Dominion forces have always been particularly close, and probably stronger than between the older Services. The Air Forces of the Dominions have been modelled on the Royal Air Force. Australia and South Africa led the way in forming Air Forces in 1920, and since then Air Forces have been formed in all the countries of the Commonwealth with the exception of Ceylon. The latest to form was the Royal Pakistan Air Force, which came into being in 1947, following the setting up of Pakistan and the division of the Royal Indian Air Force, as it then was, between India and Pakistan.

After the end of the 1914-18 war pioneering flights such as those of Van Ryneveld to the Cape and Kingsford Smith to Australia, gave an enormous impetus to the interest in flying in the Dominions, and this interest grew steadily between the wars. As a result, by 1939 the Dominion Air Forces, though comparatively small numerically, were well organised on sound lines and capable of considerable expansion to meet the needs of the war. Not only did they send many squadrons overseas (there was, for instance, a Canadian Group in Bomber Command and 27 South African squadrons in the Mediterranean theatre), but many thousands of aircrew for the Royal Air Force and the Dominions Air Forces were trained in the Dominions under the Joint Air Training Plan, and large numbers of the youth of the Dominions served in the Royal Air Force.

Since 1945 these close ties have been fully maintained. The Commonwealth Air Forces are equipped largely with British aircraft and are organised on similar lines. There is an exchange scheme for regulars, volunteers from the Commonwealth continue to join the Royal Air Force, whilst in turn young men seeking adventure from this country join the Commonwealth Air Forces, and Canada has an air training scheme for aircrews from Great Britain and the other European signatories to the North Atlantic Treaty. In common with the Royal Air Force, the Air Forces of the Commonwealth have initiated their own expansion programmes, and we can be assured that should the hour of trial come again they will be found as fully prepared as they were in the past.

The organisation of the various Air Forces is described in the following pages. All the Air Forces except the South African Air Force, which is part of the Union Defence Force and comes under the Chief of Staff, are separate Services with independent status. Only Australia, however,

has separate Ministries for the three Services. In all the others the Services come directly under the Ministry of Defence. The names of the principal officials of the Commonwealth Forces are given in the reference section.

In compiling this chapter considerable assistance has been received from the authorities of the countries concerned, and this assistance is gratefully acknowledged.

ROYAL AUSTRALIAN AIR FORCE

ORGANISATION

The Royal Australian Air Force is an independent service equal in status to the Royal Australian Navy and the Commonwealth Military Forces, and is administered by the Department of Air through the Air Board. There is also a Minister and Department of Defence, which is responsible for the co-ordination of defence matters and the formulation of a unified defence policy.

In January 1951 2 squadrons were located in Japan with the British Commonwealth Occupation Forces, 2 squadrons were located in Malaya, and the remainder were organised in five geographical areas throughout Australia. There is also a Maintenance Group and an Overseas Headquarters. Their responsibilities are allocated as follows:

Southern Area. Controls units in Victoria, Tasmania, and Southern Australia.

Eastern Area. Controls units in New South Wales and Southern Queensland.

North-Eastern Area. Controls units in Northern Queensland, New Guinea, and the adjacent islands.

North-Western Area. Controls units in the Northern Territory.

Western Area. Controls units in Western Australia.

Maintenance Group. Controls certain technical units.

Overseas Headquarters, London. Responsible for liaison with the United Kingdom authorities, and for the control of R.A.A.F. personnel serving in the United Kingdom.

EXPANSION PROGRAMME AND ROLE

The establishment of the R.A.A.F. was 8,000 in 1949, and has now been fixed at 12,000 officers and men. There are to be 17 operational squadrons, of which 9 will comprise a Task Force and 8 a Home Defence Force, made up as follows:

The Task Force: 3 bomber squadrons, 2 long-range fighter squadrons, 2 transport squadrons, 1 photographic reconnaissance squadron, and 1 tactical reconnaissance squadron.

The Home Defence Force: 4 interceptor fighter squadrons, 2 bomber-reconnaissance squadrons, 1 target-towing squadron, and 1 communication squadron.

The 4 fighter squadrons of the Home Defence Force are manned by

personnel of the Citizen Air Force, and are named after the cities where they are located. They are:

No. 21 (City of Melbourne) Squadron.

No. 22 (City of Sydney) Squadron.

No. 23 (City of Brisbane) Squadron.

No. 24 (City of Perth) Squadron.

AIRCRAFT

Fighter: D. H. Vampire, Gloster Meteor 8, North American Mustang.

Bomber: Avro Lincoln, D. H. Mosquito.

Transport: Douglas Dakota, Vickers Viking, Bristol Freighter.

Trainer: Airspeed Oxford, Avron Anson, Commonwealth Wirraway, D.H. Tiger Moth.

The R.A.A.F. will be flying over 100 jet fighters by the end of 1951, including Meteor 8's purchased from the United Kingdom and Vampires built in Australia. Some Canberras have also been purchased, and it is reported that they are to be manufactured in Melbourne.

ROYAL CANADIAN AIR FORCE

ORGANISATION

The three Services come directly under the Ministry of Defence, and there are no separate Ministries as in the United Kingdom. The Air Force Headquarters is at Ottawa, and below this level the Royal Canadian Air Force is subdivided into Commands and Groups, whose functions are as follows:

Command Headquarters, Trenton, Ontario. Controls units in Eastern Canada. There is a subordinate Group Headquarters at Halifax, which has operational control over units in the East Coast region.

Command Headquarters, Edmonton. Controls units in Western Canada, and has two subordinate Groups at Winnipeg and Vancouver.

Air Defence Group. Has a status similar to that of a Command, and is directly under Air Force Headquarters.

Air Material Command, Ottawa, and Air Transport Command, Rockcliffe. These two Commands are organised on a functional basis, and are responsible respectively for maintenance and supply, and transport, throughout the country.

EXPANSION PROGRAMME AND ROLE

The peak strength of the Air Force during the war was 215,000, and the post-war establishment was fixed at 18,278. Under the present expansion programme the establishment is to be raised to 25,000, and there will be 40 regular and auxiliary squadrons. Priority is being given to air defence, which is closely co-ordinated with that of the United States and which includes fighter squadrons, radar and communications units, and an Observer Corps. Next priority is being given to anti-submarine squadrons. Canada's main contribution to Western European defence will be an air division of 11 squadrons.

AIRCRAFT

The policy is to re-equip with aircraft and equipment produced in the United States and Canada. In conformity with this policy the standard day fighter is to be the F-86 Sabre, an American jet fighter, already on service in Korea, which is being built under licence in Canada. The all-weather fighter is to be the CF-100 Canuck, an all-Canadian two-seater twin-jet fighter. This aircraft is fitted with the Orenda jet engine, designed and built in Canada, and this engine may eventually be used in the Sabre, which is at present fitted with American engines. (The CF-100 was illustrated in Brassey's, 1950, and the Sabre is shown in this issue.) Pending the production of Sabres and Canucks 100 Mustangs have been purchased from the United States to enable the formation of additional fighter squadrons, and these are also being used for the auxiliary squadrons.

There are at present a number of Vampire aircraft, purchased from the United Kingdom, in both regular and auxiliary fighter squadrons.

North Stars and Dakotas are used for transport. Lancaster, Canso, Dakota, and Norseman aircraft are used for photographic survey work; and Harvards, Dakotas, and Expeditors are used for pilot training. Helicopters are included in the Search and Rescue units.

OPERATIONS AND TRAINING

A North Star transport squadron (426), as part of Canada's contribution to the United Nations effort in Korea, has been employed on flying troops and material to Tokyo from the American west coast.

Early in 1951 No. 421 Fighter Squadron moved to the United Kingdom for operational training in Fighter Command. It will be followed at intervals by other squadrons, and is the first of the 11 squadrons for Western Europe.

Another important contribution by Canada under the North Atlantic Treaty is the provision of training facilities in Canada: 200 aircrew of the Royal Air Force, and over 100 aircrew from Norway, France, Belgium the Netherlands, and Italy started training in Canada early in 1951. The aircrew training capacity is being built up to 3,000 Allied and Canadian aircrew a year.

Aircrew training is organised on similar lines to that of the Royal Air Force. Entrants go first to the Aircrew Classification Centre at London, Ontario. From there pilots go to the basic flying training schools at Centralia, Ontario, and Gimli, Manitoba. Navigators go to Summerside, Prince Edward Island, and radio operators to Clinton, Ontario. After gaining their wings all cadets are commissioned and go to the Air Armament School at Trenton, Ontario. Following that they go on, about a year after having commenced training, to Operational Training Units at Chatham, New Brunswick, and Greenwood, Nova Scotia, for advanced training.

There are also various technical and trade training schools, and a Survival Training School, with sections at Fort Nelson, British Columbia, and Cambridge Bay, North-West Territories, which is within the Arctic Circle. At this school aircrew are instructed in methods of bush and Arctic survival.

Officer training is undertaken on a tri-Service basis at two Colleges, there is a Royal Canadian Air Force Staff College at Toronto, and advanced instruction to senior officers is given at the National Defence College, Kingston, Ontario, which is attended by officers of all three Services and selected civil servants.

In February 1950 Exercise Sweetbriar was held. In this exercise the Royal Canadian Air Force and the Canadian Army joined forces with the United States Army and Air Force in a training operation carried out in the Yukon and Alaska.

RESERVES

There are 11 auxiliary squadrons on a part-time basis, and a number of ground units are being formed. There are also reserve flights at nine universities.

The Air Cadet League of Canada has squadrons throughout the country and has an establishment of 22,500, to which it was raised from 15,000 during 1950.

An Observer Corps of 150,000 volunteers is being organised on similar lines to the Corps in Great Britain and the United States.

SUBSIDIARY ROLES

An important peace-time role is the air survey of Canada, which was started in 1921 and which has played a prominent part in assisting the development of the natural resources of the country. By the end of 1950 almost every part of Canada had been covered by aerial photography, and the scale of the work will be considerably reduced from now on, the aircraft and personnel thus becoming available being transferred to other units.

There is a Search and Rescue organisation covering the whole country whose primary responsibility is to carry out Canada's international commitments in this respect under the International Civil Aviation Organisation, whereby Canada is responsible for assisting aircraft in distress on the east and west coasts. In addition aircraft in distress in the interior are also assisted, and another important part of their work is the operation of an air ambulance service where no other form of transport is available.

SUMMARY

Since the war the Royal Canadian Air Force has concentrated upon building up the necessary framework for expansion in emergency. As a result, when the international situation deteriorated rapidly in 1950 the Air Force was well placed to go ahead with the three-year expansion programme which has been announced by the Canadian Government. \$5,000 million will be spent in this period, and of this a large part will be required by the Air Force to re-equip with Sabre and Canuck aircraft and to provide the 11 squadrons for Western Europe.

The Royal Canadian Air Force played a prominent part in the defeat of Germany and provided a large proportion of the aircrews in Bomber Command. It has proud traditions and high standards, and these standards are being fully maintained in the post-war force. Though small, the Air Force is highly efficient and fully prepared to give a good account of itself in war.

INDIAN AIR FORCE

HISTORICAL

The Indian Air Force was formed in 1932, when the first flight was raised at Karachi. When the Dominions of India and Pakistan came into being in July 1947 the Air Force was divided between the two Dominions, India retaining 7 fighter and 1 transport squadrons. The title Royal was conferred by the King in 1945, but this was dropped when India became a Republic on January 26, 1950.

ORGANISATION

The three Services are separate and come directly under the Minister of Defence, as there are no Service Ministers. Headquarters is at Delhi, and there are bases at Bangalore, Madras, Poona, Agra, and Kanpur. The operational units consist of fighter squadrons, a communication squadron, air observation post flights, and a bomber-reconnaissance unit.

TRAINING

Nos. 1 and 2 Air Force Academies for flying training are at Ambala and Jodhpur, there is an Air Force Wing in the Staff College at Wellington, and there are Technical Training Colleges and other training establishments at Bangalore and Madras.

AIRCRAFT

Fighters: Hawker Tempest 2, D.H. Vampire 5.

Bomber-Reconnaissance: Convair Liberator.

Transport: Douglas Dakota, D.H. Devon.

A.O.P.: Auster 5.

Training: D.H. Tiger Moth, Percival Prentice, Supermarine Spitfire.

ROYAL NEW ZEALAND AIR FORCE

ORGANISATION

The Royal New Zealand Air Force is a separate arm of the defence forces, and is administered by the Minister of Defence through the Air Board, of which he is also the Chairman.

The approved establishment, including the Women's Auxiliary Air Force, which is an integral part of the regular Air Force, is 598 officers and 3,711 other ranks. There is also the Territorial Air Force, the Air Force Reserve, and the Air Training Corps.

There are 5 regular operational squadrons, 1 fighter-bomber, 2 medium-bomber reconnaissance, 1 flying boat, and 1 transport squadron. There is also a general purpose squadron, which is responsible for communications, forest fire patrols, and miscellaneous duties. In addition to its normal service duties the flying boat squadron, which is based at Fiji, with a detached flight at Auckland, is responsible for air-sea rescue services for both military and civil aircraft in the South Pacific area.

AIRCRAFT

Fighter-bomber and medium-bomber: Mosquito.

Flying boat: Catalina.

Transport: Dakota.

General purpose: Devon, Avenger.

Research and development: Miles Aerovan.

Training: Tiger Moth, Oxford, Harvard, Anson.

In order to re-equip the force with more modern types, orders are being placed in the United Kingdom for a number of aircraft. These include De Havilland Devons for advanced air training, Vampire fighters, and Bristol Freighters and Handley Page Hastings for transport work.

ROYAL PAKISTAN AIR FORCE**HISTORICAL**

The Royal Pakistan Air Force was formed on August 15, 1947, following the division of the former Royal Indian Air Force between the two Dominions of India and Pakistan, under which Pakistan received one fighter squadron in an operational state and a transport squadron without its aircraft. Largely by a process of barter with India in the initial stages, the Air Force was gradually built up into an efficient force.

ORGANISATION

The three Services are separate, but there are no Service Ministers, and they come directly under the Minister of Defence. Headquarters is at Mauripur, Karachi, and there are other bases at Peshawar, Razmak, and Dacca in East Bengal. The operational units include two fighter squadrons, a transport squadron, and an artillery liaison flight.

TRAINING

The principal training establishments are:

R.P.A.F. College, Risalpur.

Recruits Training Centre, Kohat.

Technical Training School, Drigh Road, Karachi.

School of Administration.

Apprentices and Trade Conversion Training School, Karachi.

Radar School (for the three Services).

In addition some 400 apprentices are being trained in the United Kingdom by the Royal Air Force, which is also training a number of airmen. Some personnel are also trained in the United States and Australia.

AIRCRAFT

Fighter: Hawker Fury 60 and Tempest 2.

Bomber: Handley Page Halifax.

Transport: Bristol Freighter, Dakota.

A.O.P.: Auster 5.

Trainer: D.H. Tiger Moth, Hawker Fury T.61, North American Harvard.

RESERVES

There are university air squadrons at Dacca, Lahore, Peshawar, and Karachi, and there are Air Scout Clubs, which give ground and flying training, at the same places and at Rawalpindi.

There is also a Volunteer Reserve, and a plan for the formation of auxiliary squadrons in an emergency.

SOUTH AFRICAN AIR FORCE

HISTORICAL

The South African Air Force was formed in 1920 following the disbandment of the South African Aviation Corps, which had been raised in 1915 for service in German South-West Africa. Between the wars the Force was maintained on a small scale, and the strength on the outbreak of war in 1939 was about 1,600 permanent officers and men. During the war units of the Force served in many parts of the world, and the peak strength in 1944 was 45,000, including 6,500 W.A.A.F. The greatest effort was in the Mediterranean theatre, where there were 27 operational squadrons at the peak in 1944. In addition South Africa played a considerable part in the Joint Air Training Scheme, and some 33,000 aircrew were trained in 36 Air Schools in South Africa. After the war the strength of the Air Force was fixed in 1946 at 10,000 men, of which one-third was to be permanent and the remainder from the Active Citizen Force.

ORGANISATION

The Air Force is a component of the Union Defence Force and is administered by the Minister of Defence through the Chief of the General Staff and the Director General of the Air Force, who is in charge of the Air Directorate. There are three policy branches in the Directorate—Air, Maintenance, and Administration.

Below the Directorate there are some nine Air Stations, of which six are airfields and one a flying-boat base.

The operational units consist of 15 squadrons, organised in a fighter wing, a medium bomber wing, a coastal reconnaissance wing, and a transport squadron. In addition to the operational units there is a Central Flying School, a Bombing, Gunnery, and Air Navigation School, a School of Technical Training, a Photographic School, and a Wireless School. There are also two Air Repair Depots, two Air Stores Depots, and an Aircraft Storage Depot.

TRAINING

The main flying training effort is carried out in the Union Air Training Group, which is a joint civil-military organisation responsible for training pilots for the Active Citizen Force. These pilots are trained at civil flying clubs and the Central Flying School.

Permanent officers are trained at the South African Military College in the first instance, and then go to the Central Flying School for their flying training.

Some airmen also go to the United Kingdom for training, and a start has been made with sending airmen to the United States for training.

AIRCRAFT

Fighter: D.H. Vampire 5, Spitfire 9.

Medium bomber: Lockheed Ventura B.34.

General reconnaissance: Short Sunderland, Lockheed Ventura PV.1.

Transport: Douglas Dakota, D.H. Devon.

A.O.P.: Auster.

Training: North American Harvard.

RESERVES

The Air Force element of the Active Citizen Force, in which service is compulsory, provides the aircrew and ground staff for some 7 squadrons, and a S.A.A.F. Reserve is being formed.

W. M. Yool

CHAPTER XXVII

FOREIGN AIR FORCES

SUBJECT TO the inevitable restrictions of security, the present review gives a fairly complete picture of international air power. Information on the Russian Air Force is, of course, still scanty; nevertheless, events in Korea have proved the quality of the newest Soviet fighters. There is also further confirmation of earlier reports that Russia's growing bomber force consists mainly of Soviet-built copies of the American B-29.

Other nations overseas concentrate on re-equipping their squadrons with jet interceptors and fighter-bombers—mainly of British or American design. Only the vast resources of the United States are sufficient to maintain a powerful long-range bomber force with such machines—as yet unmatched elsewhere—as the B-36 and B-50. Piston-engined bombers of this calibre are still the “supreme expression of military power,” although efforts are being made in America, Britain, and Russia towards the introduction of jet aircraft in tactical and strategic bomber squadrons.

U.S. AIR FORCE

At the beginning of the Korean conflict the strength of the U.S.A.F. was forty-eight groups—less than that of the Army Air Corps at the time of Pearl Harbour. Rapid expansion has been under way ever since; precise figures are not available, but “over 100” groups, including 36 National Guard reserve units, were stated to be the target for June of this year. Group strengths vary according to function; a group might consist of seventy-five fighters, forty-eight light bombers or troop-carriers, or thirty B-36 heavy bombers.

FIGHTERS

All regular day-fighter groups have now been re-equipped with jet aircraft, the types in service being the North American F-86 Sabre, the Republic F-84 Thunderjet, and the Lockheed F-80 Shooting Star. The oldest of the trio is the F-80, over 1,700 of which were delivered to the U.S.A.F. before production ceased.

Several groups of F-80C's were operated over Korea from the earliest days of the campaign. Though heavily burdened with outsize long-range fuel tanks, they quickly and definitely established the potentialities of the jet fighter as a ground-attack weapon, using 5-inch rockets, bombs, or “napalm” petrol-jelly tanks and the fixed nose-mounted armament of six 0.5-inch Browning guns. The F-80 is powered by a single “Allison” J-33 centrifugal turbojet, a robust, long-life unit which has shown ability to withstand severe battle damage; maximum speed approaches 600 m.p.h.

Long endurance is a primary characteristic of the F-84E Thunderjet, which is well suited to ground-attack work and has—like the F-80 and F-86—been “blooded” in Korea. This fighter has an axial-flow J-35

turbojet, and performance and armament similar to those of the F-80. With extra fuel in wing-tip tanks, the F-84 has a combat radius of 1,000 miles. Two aircraft of this type were used last year in a practical test of the value of flight refuelling; they flew the Atlantic non-stop from Britain by the northern route, refuelling in the air four times *en route*. Production has been ordered of a new, more powerful, Thunderjet, the F-84F with swept-back wings and tail, powered by the British "Sapphire" turbojet built by Curtiss-Wright.

The F-86A Sabre is of more modern origin than its straight-winged counterparts and, by comparison, is used mainly for escort and interception duties (though offensive weapons for ground attack can be carried beneath the wings). With a top speed of 670 m.p.h., the Sabre proved capable of meeting the challenge of the speedy Mig-15 interceptors when they appeared over Korea. Its power unit is an axial-flow General Electric J-47 of 5,000-lb. thrust, and the fixed armament is six 0.5-inch guns. The F-86A has been replaced on the production lines by the F-86E, which is generally similar but has, among detail improvements, a new variable-incidence tailplane for better control at high subsonic speeds.

Jet fighters are also coming into service with the night and all-weather fighter squadrons; the piston-engined F-82 Twin Mustangs and F-61 Black Widows are being replaced by the Lockheed F-94 (two-seat, radar-equipped version of the Shooting Star) and Northrop F-89 Scorpion. The F-94C variant has an exceptionally high rate of climb, being powered by a J-48 turbojet of 6,500-lb. thrust, increased for brief periods by after-burning. (This unit is Pratt and Whitney's version of the Rolls-Royce "Tay".) Nevertheless, the lightly armed Lockheed is an interim design, and the major burden of all-weather defence will eventually fall on the Scorpion (over 500 are reported to be on order) and the F-86D. The former is powered by two Allison J-35s, giving a total of over 12,000-lb. thrust, and has a speed claimed to be in excess of 600 m.p.h. The F-86D is a modified Sabre, having airborne-interception radar in the nose, with air intakes transferred to the fuselage sides. It can carry twenty-four "Mighty Mouse" air-to-air rocket projectiles for use against bomber formations.

Other swept-winged American fighters developed for the U.S.A.F., but not definitely ordered in quantity, are the twin-jet Lockheed XF-90 and McDonnell XF-88 "penetration" fighters, for long-range escort and ground-attack, and the jet-plus-rocket-powered Republic XF-91 interceptor.

BOMBERS

First in size and importance among United States bombers is the Convair B-36D, which was designed for "intercontinental" operation—the carriage of 10,000 lb. of bombs for a range of 10,000 miles (or a greater load for a lesser journey). This massive (358,000 lb.) aircraft has a maximum bomb load of 84,000 lb. and a defensive armament of sixteen 20-mm. guns in remotely controlled, retractable turrets. It has ten power units—six piston engines (3,500 h.p. "Wasp Majors") in pusher installations and four J-47 jets paired in under-wing "pods." The jets are used for take-off, climb, and combat; they are brought into operation 200 miles or more before the objective is reached and help to build up an

over-the-target speed of 435 m.p.h. at bombing heights above 40,000 feet. An experimental all-jet version of the B-36 is being built.

B-36's, then, are the core of the U.S.A.F. Strategic Air Command. Their offensive weight is supplemented by groups of B-29 and B-50 "medium" bombers, most of which are equipped with flight-refuelling attachments and operate alongside KB-29 tanker aircraft. The B-29 Superfortress, powered by four 2,000-h.p. Wright R-3350 engines, carries up to 20,000 lb. of bombs and has a cruising speed of 300 m.p.h. at 35,000 feet. In the more powerful B-50 this performance has been increased all round by the use of "Wasp Major" engines (as fitted to the B-36) and a number of structural improvements. Comparative operating weights for the two aircraft are 120,000 lb. (B-29) and 164,500 lb. (B-50).

Although several prototypes have appeared, only two jet-bomber types are operational with the U.S.A.F. The North American B-45 Tornado, the first in service, is a four-jet machine with a limited range, confining its usefulness to tactical operations. The second is the B-47 Stratojet with six J-35 turbojets and a speed of 600 m.p.h., on which it relies mainly for defence. The B-47's bomb load is reported to be over 20,000 lb. and its range is some 2,000 miles; however, successful experiments in flight-refuelling a B-47, in the light of U.S.A.F. squadron experience with this method of extending range, suggest that relatively short endurance will not dissuade America from employing this aircraft on a large scale. The B-47 has a crew of three: pilot; signaller/bomb-aimer/navigator; and tail-gunner.

A third jet bomber (although adapted for night-intruding duties) will shortly be in service with the U.S.A.F.—the English Electric Canberra. Designated B-57A, the Canberra is being built in America by the Glenn L. Martin Company. Its introduction should see the retirement of the twin-piston-engined Douglas B-26 "Invader" light bomber.

RECONNAISSANCE

For short-range reconnaissance the U.S.A.F. has adopted a new version of the Thunderjet (RF-84) to supplement the RF-80 Shooting Star. Equally modern is the equipment of the strategic reconnaissance groups: the RB-45 Tornado with external tanks and provision for flight-refuelling, the RB-36, and RB-50. All American reconnaissance aircraft are thus seen to be camera-equipped variants of bombers or fighters in first-line service.

TRANSPORT

High-speed, long-range carriage of high-priority equipment or personnel is mainly undertaken by the inter-Service Military Air Transport service, using C-97 Stratofreighters and C-54 Skymasters. The U.S.A.F. Strategic Air Command has its own transport section, equipped with the C-54, C-74, and C-124. The C-124 Globemaster II, with four "Wasp Majors" and capacity for 200 men, is the world's largest military transport. Tactical troop- and supply-carrying is undertaken by the C-47 Dakota and C-82 and C-119 Packets. The twin-boom Packet is particularly well suited to quick loading and unloading, and a new version, the XC-120, features an interchangeable and removable cargo-hold.

TRAINERS

War-time T-6s (Harvards) are still used for basic training, but production of the post-war North American T-28 has been increased. Advanced training of fighter pilots is undertaken by the two-seat T-33 Shooting Star, while a training version of the B-50 has been prepared for schooling the coming breed of "triple-duty" navigator/bombardier/radar-operators of jet-bomber crews.

HELICOPTERS

In addition to supplementing the work of such "liaison" aircraft as the Sentinel light monoplane as air observation posts, helicopters have proved invaluable for rescue work in Korea. Bell and Sikorsky types have given especially good service under operational conditions.

U.S. NAVY

The increasing threat of the submarine has strengthened the case for a powerful Naval air arm, and the permission granted the United States Navy to build a 56,000-ton aircraft carrier is evidence of the American government's concern in this matter. The reduction, early in 1950, in Naval air strength was followed by the Korean crisis, with consequent rearmament; and American Naval and Marine squadrons are again being built up.

FIGHTERS

Supporting operations off Korea by American carriers appear to have convinced the United States Navy of the need to maintain both piston- and jet-powered fighters. The heavy loads carried by the Corsair on ground-attack sorties have not been exceeded by the Panther jet fighter; but the carrier requires its own jets for defence against fast enemy air forces. Consequently, the 1941-vintage Corsair is still in production, although the newest United States Naval jets concede little in performance to their land-based counterparts. The two single-seat, jet fighters in first-line service are the Gruman F9F-2 and -3 Panther and McDonnell F2H-2 Banshee. The first type of Panther has an American-built Rolls-Royce "Nene" and is capable of approximately 600 m.p.h.; the Banshee (two Westinghouse J-34) is slower but has a remarkably good high-altitude performance. The speed and climb of the Panther have been improved in the latest version by installation of the J-48 ("Tay") of 6,500-lb. thrust. Both fighters have four 20-mm. guns as fixed armament.

The Chance-Vought Corsair, which is powered by a Pratt and Whitney radial piston engine of 2,500 h.p., has a maximum speed of 450 m.p.h. and can carry external loads of up to two 2,000-lb. bombs. A night fighter version is in service. The Chance-Vought Company is also producing for the United States Navy one of the most advanced deck-landing aircraft in the world—the F-7U Cutlass, a tailless, swept-wing interceptor powered by two J-34 turbojets. Its speed is claimed to be in the region of 700 m.p.h. For all-weather (and night) interception the Douglas F3D Skyknight, a heavy two-seater, is coming into service. Later it will be supplemented by a Naval version of the all-weather YF-86D Sabre

redesignated F2J. Another swept-wing interceptor designed for deck operation, though not yet adopted, is the Douglas XF4D, powered by the new Westinghouse J-40 turbojet; no performance data are yet available, but a very high speed and rate of climb may be expected.

STRIKE AIRCRAFT

Predominant among American Naval strike aircraft is the Douglas AD-2 Skyraider. This powerful machine is unusually large for a single-seater, weighing over 16,000 lb. and spanning 50 feet. Its power unit is a 2,500 h.p. Wright R-3350, giving a top speed of well over 300 m.p.h., which is, however, normally reduced by external loads. These vary from two torpedoes to 6,000 lb. of bombs or 5-inch rockets. Experience gained with the versatile Skyraider has been embodied in its successor the Douglas XA2D Skyshark. Slightly heavier than the AD-2, the Skyshark is powered by an Allison XT-40 power unit, consisting of two coupled T-38 turboprops and providing 5,500 h.p. It has not yet completed testing prior to introduction. Now in limited service is the North American AJ-1 attack aircraft, powered by two 2,300-h.p. Pratt and Whitney radials and one Allison J-33 turbojet mounted in the tail, giving extra power for take-off and combat. At a gross weight of 55,000 lb., the AJ-1 is the heaviest aircraft to have landed on a carrier. It is capable of carrying an atomic bomb.

PATROL

Well equipped for anti-submarine work, the Lockheed P2V Neptune is the standard patrol bomber of the Navy. It has extremely long endurance, and an early model set up the world's long-range record (over 11,000 miles) in 1946. Comprehensive radar, sonobuoys, and, it is reported, magnetic detection gear enable the Neptune to seek out schnorkel-equipped submarines; its offensive armament consists of up to six fixed, forward-firing, 20-mm. guns, sixteen rocket projectiles, and 8,000 lb. of bombs or two 2,165-lb. torpedoes. Alternative loads are twelve depth charges or two mines. Although normally land-based, the Neptune can be carrier-launched with the aid of J.A.T.O. rockets. Latest of the Neptune series is the P2V-4, with two 3,250-h.p. Wright "compounded" engines, giving an estimated range of 4,200 miles. Another large patrol aircraft is the Martin P4M-1 Mercator, with twin piston-engines in nacelles which also house two turbojets for extra combat speed. This aircraft is in limited service.

Two versions of the single-engined Grumman Guardian are in production—each designed to operate in conjunction with the other as a "hunter/killer" team. The AF-2W carries search radar, and targets discovered by it are attacked by the AF-2S anti-submarine strike version.

Martin Mariner flying-boats, of war-time vintage, are still in service, but the new twin-engined Martin Marlin will be introduced as a successor. The Marlin differs mainly in employing more powerful engines and incorporating advances in hydrodynamic design and anti-submarine equipment. The Navy's range of patrol aircraft has a unique supplement in a fleet of airships. (Over 130 United States Navy airships saw service during the war.) Now being built for the Navy, the new Goodyear M

ship is powered by two 800-h.p. Wright radial engines, giving a top speed of 75 knots. A crew of fourteen is specified. War-time ships of class G, K, L, and M are kept in service mainly for training purposes.

TRANSPORTS

Land-based transports used by the Navy include the ubiquitous Douglas Dakota and Skymaster. Two 162-passenger Lockheed Constitutions are being used for carrying high-priority men and equipment on long-range flights. A small number of Martin Mars flying-boats are employed for the same purpose, and the turboprop-powered Convair XP5Y-1 (146-foot-span flying-boat originally designed for anti-submarine work) will be adopted as a new long-range transport. For communications and rescue the Grumman Goose and Duck amphibians are employed; and extensive use is also made of Bell, Sikorsky, and Piasecki helicopters for these purposes.

U.S.S.R.

FIGHTERS

Precise and authentic information on the composition and strength of the Russian Air Force is still rare. One of the most definite and significant discoveries made during the past year concerns the existence, in very large numbers, of efficient, high-performance jet interceptors. The term interceptor should be stressed, for the new Soviet fighters appear to be primarily suited, by design and performance, to defensive air-to-air combat, and are likely to prove less adaptable for ground-attack duties than their British and American counterparts. Information concerning the latest Russian aircraft has been transmitted in reports from satellite nations, from Russian-made films, and, of course, from Korea, where one type—the Mig-15—has been used operationally in fairly large numbers.

At the time of writing, Mig-15s had appeared only over Communist-held territory, and though several had fallen to the guns of United Nations aircraft, none had been captured or scrutinised at close quarters. Many questions regarding the Mig's construction and performance therefore remain unanswered.

It seems, however, that only the F-86 Sabre is capable of matching the level-speed capabilities of the Mig-15, which can probably attain at least 650 m.p.h. This estimate is borne out by the use of swept-back wing and tail surfaces (as with the Sabre). With a span and length of little more than 30 feet, the Mig-15 is comparatively small by present-day standards. Combat reports tell of a high rate of climb (the use of afterburning is suspected but not confirmed) and good manœuvrability—qualities likely to be found in a lightly built, powerful fighter. Official reports now confirm that the Mig-15 is powered by a Russian-built version of the Rolls-Royce "Nene" turbojet (as exported to the U.S.S.R. in 1947), developed by Russian and German technicians, and delivering well over 5,000 lb. thrust. Like the Sabre and Thunderjet, the Russian machine has "straight-through" intake and exhaust ducting for its single fuselage-mounted turbojet. Of clean and modern design, the Mig-15 betrays few characteristics to a superficial inspection. The armament is mounted, semi-externally in blister-type fairings, in the nose: it probably consists

of two or three guns of mixed calibres. Dive-brakes follow American practice in opening forward from the rear fuselage.

The existence has also been revealed of a second swept-wing Russian fighter, possibly of Lavochkin design. This aircraft bears a fairly close resemblance to the Mig-15, and, generally speaking, may be considered as comparable in performance and function. Less positive is information on other advanced Soviet interceptors: the designation La-15 has been quoted with reference to a swept-wing machine having two axial turbojets and intended for all-weather interception. Although little evidence in support of this report is forthcoming, there can be little doubt that Soviet interest—and success—in producing practicable modern interceptors has not been confined to operations by day and fair weather only. Another basically German design reported to have undergone further development in the U.S.S.R. is given the provisional designation Yak-21; this is said to be a version of the Me 263 rocket-powered interceptor.

Two older jet fighters in large-scale service with the Red Air Force are the Mig-9 and Yak-15. The latter is a medium-performance fighter with a speed of little more than 500 m.p.h. It is powered by a single axial-flow turbojet supplied with air from a nose-intake and exhausting from the “stepped” fuselage beneath the trailing edge of the wing. Based on a piston-engined design, it follows a “makeshift” aerodynamic formula and is unusual in having a large fairing for the nosewheel beneath the front portion of the fuselage. Its probable armament is one 20-mm. and two 12·7-mm. guns.

A similar type of engine-installation is used for the two axial turbojets of the Mig-9, one of the earliest Russian jet aircraft. Its estimated span and length of, respectively, 42 feet and 38 feet mark it as a heavier type than most other Russian jet fighters.

Among airscrew-driven fighters the most recent and most prominent is the La-11, which has an “Ash” radial engine of some 2,000 h.p. and attains over 400 m.p.h. Three guns are said to form the fixed armament, and provision is probably made for wing-mounted bombs or rockets. The Yak-3 and Yak-9, with performances generally inferior to several obsolete Allied piston-engined fighters, are now disappearing from Russian first-line service.

ATTACK

The nearest Western counterpart to the Il-2 and Il-10 series of single-engined low-flying attack machines is the United States Navy's carrier-based Douglas Skyraider. The Russian aircraft, however, have a two-man crew, a less powerful liquid-cooled engine of some 2,000 h.p., and carry a relatively small bomb load internally. They are, however, heavily armoured and mount up to six guns (both 20-mm. and smaller-calibre weapons are employed) in wing and dorsal positions. Underwing attachments are provided for rocket projectiles.

BOMBERS

Russia's only heavy-bomber design (classed as “medium” in America, its country of origin) is an apparently precise copy of the Boeing B-29 Superfortress. The copy-design work was completed and production

begun shortly after the war, following the acquisition of three intact B-29s which landed in Siberia. It has now been established that large numbers are in service, but it is still not known whether the operational equipment or methods used by the U.S.A.F. have been fully adopted by the Russian squadrons. The Soviet engineers may have decided to omit or simplify the pressurising system of the B-29, which greatly improves the comfort (and efficiency) of crews. The elaborate fire-control system of the B-29's remotely operated guns is an important factor in this bomber's formidable protection against fighter-attacks; simplifications or omissions in the Russian "facsimile" B-29's defensive equipment would render it a less effective bomber—as would the use of radar equipment outdated by the latest Western developments.

Reference must be made to two light bombers still serving in large numbers. Comparable in function to the Douglas B-26 Invader or Bristol Brigand, the Tu-2 is a twin-engined machine with a bomb load of some 4,000 lb. Its engines are "Ash" radials of approximately 2,000 h.p. For ground-attack, two fixed, forward-firing 20-mm. guns are fitted, and three 12·7-mm. guns are mounted in dorsal and ventral positions. The lighter Pe-2 has liquid-cooled engines, basically of Hispano-Suiza design, and carries a 2,000-lb. bomb load on external racks. Its armament is light: two fixed 12·7-mm. guns in the nose and two manually operated weapons of the same type in dorsal and ventral positions.

While limited information is available on Russian jet-bomber designs, the degree to which they have been developed and the numbers actually in service are unknown. One of the earliest types was a Tupolev design based on the Tu-2 already referred to. Believed to have a top speed of some 450 m.p.h., this aircraft resembled its airscrew-driven predecessor in wing and tail configuration, but had two axial-flow turbojets in large underslung nacelles and a slimmer fuselage. A later Tupolev jet bomber, with the reported designation Tu-10, also has large underslung nacelles for two turbojets and a high-position thin wing. Tail surfaces are swept back, but the wing is straight. A transparent nose for bomb-aiming is provided. The Tu-10 is probably intended for tactical bombing, like the Canberra; unlike the British jet aircraft, however, it possesses a tail gun-position. Its speed would depend on the power units employed, but an estimate of 580 m.p.h. is acceptable.

A larger and older jet bomber—never put into service—is believed to be of Ilyushin design, and had four turbojets suspended from the high straight wing in "pods" somewhat similar to those of the American B-47. Its nearest tactical counterpart would appear to be the North American B-45, which weighs 82,600 lb. and has a 20,000-lb. bomb load.

TRANSPORTS

Largest of the Soviet transports is the Tu-70, a development of the B-29-type bomber and capable of accommodating about seventy passengers. There is no evidence of large-scale production. The Li-2 is Russia's version of the Dakota; it is distinguished by the use of single-row radial engines of 1,000 h.p. and—on occasions—by the dorsal gun-position sometimes fitted. Capable of carrying thirty-two passengers, the post-war Il-12 is of completely Russian design. The engines are two-row "Ash" radials of 1,650 h.p., and a nose-wheel-type undercarriage is

employed. A civil Il-12, operated by Czech State Airlines, was examined in this country and gave evidence of good workmanship.

TRAINERS

The small Po-2 biplane is still used extensively for communications and observation as well as basic training. Of more recent design is the Yak-18, fully equipped with radio and blind-flying instruments, and powered by a 160-h.p. M-11 radial engine. Its top speed is about 160 m.p.h. Another monoplane trainer in service is the Yak-11.

FRANCE

Military aviation in France is divided into two sections—the *Armée de l’Air* and *L’Aéronautique Navale*. Most squadrons are equipped with aircraft designed (and, in most cases, produced) by Britain or America. Only within the past year or so has the French aircraft industry begun to put any of its numerous prototypes into production on any considerable scale. De Havilland Vampire 5s equip several fighter squadrons. The majority were built in England, but this type is now being quantity-produced in France; it is being succeeded on the production line by a “Nene”-powered development of the Vampire named the Mistral, with Rolls-Royce turbojet built under licence by Hispano-Suiza. Also in production is the Marcel Dassault 450 Ouragan, a 590-m.p.h. interceptor with a single “Nene.” Some squadrons are now being equipped with Republic F-84E Thunderjets, supplied by America under the terms of the North Atlantic Treaty. Two piston-engined types are in service still—the Republic Thunderbolt and Supermarine Spitfire. Fighters used for reconnaissance are the Mustang, Lightning, and Mosquito (also employed as a fighter-bomber).

The small French bomber force is equipped with Halifaxes and Marauders. Transports include the Junkers 52, Aerocentre NC 701 (French-built Siebel 204), Dakota, Halifax, and Languedoc 161, which was designed as an airliner. For “colonial transport” work the Dassault 315 has lately gone into service. This ten-passenger machine, which supplements Ansons and Fieseler Storchs in the French colonies, may be adapted for ground-attack against lightly defended targets.

French Naval Aviation operates flying-boat squadrons—equipped with Sunderlands, Breguet 730s and 731s, and Dornier 24s—in addition to fighter units flying Seafires, Hellcats, and Bearcats. Medium and light bombers for reconnaissance and strike work are the Wellington, Bloch 175, and two United States types of single-engined dive bomber—Dauntless and Helldiver.

SWEDEN

Possessing between 1,000 and 1,500 aircraft, Sweden has the third most powerful Air Force in Europe. The emphasis is on defence, and the projected fighter strength is 750 day fighters (ten wings of seventy-five aircraft) and seventy-five night fighters. At present some 200 Vampire 1s and 50s are in service and an equal combined total of Spitfires and Mustangs. The new Saab J-29 swept-wing fighter (powered by a “Ghost”

and probably capable of 650 m.p.h.) is now in squadron service; 500 are believed to be on order. An earlier Saab fighter—the J-21—is still in service in both jet- and piston-powered forms. For ground-attack the Saab-18B twin-engined light bomber and the single-engined Saab A-21 are employed. The Mosquito is the standard night fighter, and reconnaissance is undertaken by the Spitfire, Mustang, Saab-18, and Storch. A variety of other aircraft are used for transport, rescue, and training; they include the Ju 86K, Beech C-45, Dove, Norseman, Do 24, Catalina, Bestmann, and Harvard.

BELGIUM

For interception Belgium relies on Meteor 4s and 8s and a decreasing number of Spitfires. The latest type of fighter-bomber in service with the Belgian Air Force is the Republic F-84, a number of which have been supplied by America recently. Standard light bomber is the Mosquito 16. Trainers are the Meteor 7, Oxford, Harvard, Tiger Moth, and Stampe S.V.4b.

HOLLAND

The Meteor 8, as built by Fokker for Holland and Belgium, is the standard Netherlands Army Air Force fighter. Some fifty to one hundred Thunderjets will also help to replace the piston-engined Spitfire and Mustang fighters in service. For training, Holland uses the Fokker S.11, Oxford, Anson, and Meteor 7; the Fairey Operational Trainer is used by the Naval Air Service, whose standard fighter is the Sea Fury. Also in Naval service are the Firefly and Catalina. For patrol and bombing the Navy (like the Army) employs the Mitchell.

DENMARK

The Danish Air Force is entirely defensive in composition, consisting mainly of fighters—Meteor 4 and 8 and Spitfire. Trainers are the Chipmunk, Harvard, Oxford, Meteor 7; and reconnaissance, rescue, and communications are undertaken with the Sea Otter, Norseman, and Catalina.

NORWAY

Vampires—Marks 3 and 52—form the nucleus of the Norwegian first-line strength. The Spitfire and Mosquito are also used by day- and night-fighter squadrons. Standard transport is the Dakota; and trainers are the Cornell, Harvard, Anson, and Oxford.

SWITZERLAND

Some eighty-odd Vampires have been delivered to Switzerland, where the D.H. Venom is to be built under licence for the Air Force. Mustangs are also in service. For training, German Bückers and Messerschmitts are used, together with Swiss-built Pilatus P-2s.

ITALY

Limited to a fighter-strength of some 200 aircraft by peace-treaty conditions, Italy has decided to employ Vampires and Venoms—built under licence—almost exclusively. At present, however, Spitfires and Mustangs equip most squadrons. Transports and trainers are, in the main, British or American types, though the quality of recent products of the Italian industry indicates probable reductions in the use of overseas-built aircraft. Among promising prototypes is the Fiat G.80 jet trainer.

ARGENTINA

Still the only South American nation to employ jet aircraft, Argentina has up to 100 Gloster Meteor 4s in service. It is expected that a newer, Argentine-built fighter, the I.Ae. Pulqui II, will later supplement the British interceptor. This advanced machine is powered by a "Nene" and was designed by the former Focke-Wulf engineer Kurt Tank. Other Argentine fighters are the Fiat G.55 and I.Ae.24 Calquin. The latter has two Pratt and Whitney "Twin Wasp" radials and is used mainly for ground attack, carrying 20-mm. guns, 1,700 lb. of bombs or rockets. Standard heavy bomber is the Avro Lincoln—as employed by the R.A.F. Transports and trainers include the Bristol 170 Freighter, Catalina, and Percival Prentice.

CZECHOSLOVAKIA

Obsolete Russian aircraft are the main equipment of the Czech Air Force. La-7 fighters and twin-engined Pe-2 light bombers are used, together with Czech-built, German-designed Me 109 fighters. Transports are the Ju 52 and Dakota.

EGYPT

Meteors and Vampires—in small numbers—are the only up-to-date operational aircraft serving in Egypt. Two Italian machines used as fighter-bombers are the Macchi C.205 and Fiat G.55, while standard trainers are the Harvard and Anson. Dakotas, Doves, and Commandos equip Egypt's main transport force. Vampire night-fighters were ordered by Egypt during 1950 but were diverted to the R.A.F.

TURKEY

Turkey's Air Force expects to take delivery of 100 American fighters (Thunderjets or Shooting Stars) in partial replacement of some of the airscrew-driven fighters now in service. The main operational types at present are the Spitfire (Marks 5, 9, and 19), Thunderbolt, Mosquito, and Douglas Invader. Transports and trainers include the Dakota, Beechcraft AT-11, and Harvard.

IRAN

Thunderbolts and Hurricanes are used for interception and ground-attack. Ansons and Tiger Moths serve for training and communications.

IRAQ

The Hawker Fury, a land-based equivalent of the Royal Navy's main piston-engined fighter, is the standard fighter-bomber of the Royal Iraqi Air Force, which also possesses Tiger Moth and Anson trainers.

H. F. KING

CHAPTER XXVIII

OPERATIONAL TRAINING IN THE ROYAL AIR FORCE, 1950

THE OPERATIONAL training requirements of the Royal Air Force arise directly from the respective roles of each of the Operational Commands. Since the Commander-in-Chief of each Command is responsible for the operational efficiency of his Command in fulfilling its allotted role, it is logical that all operational training from the Operational Conversion Unit (O.C.U.) stage onwards should be under the direction and control of the Operational Commanders.

Pilots and crews, therefore, that have been trained so far in Flying Training Command and have passed successively through the Initial, Basic, and Applied stages of flying training within Flying Training Command and have completed their pure flying training, are now posted to the Operational Conversion Units under the control of the Operational Commands. At the O.C.U.s. they learn to apply the current techniques and tactics on operational aircraft and they are trained to take their place in a front-line squadron.

For reasons of economy, the bulk of operational conversion training in the bomber, fighter and ground attack, coastal and transport roles is carried out in the United Kingdom.

There are seven major operational Commands in the Royal Air Force:

- (a) Bomber Command
- (b) Fighter Command
- (c) Coastal Command
- (d) Transport Command
- (e) British Air Forces of Occupation
- (f) Middle East Air Forces
- (g) Far East Air Forces

The training of those elements which go to make up a Tactical Air Force is initially entrusted to the four United Kingdom-based Operational Commands. O.C.U. light bomber training is undertaken in Bomber Command and latterly, to some extent, in Germany directly under B.A.F.O.; O.C.U. training of fighter and ground attack pilots is carried out in Fighter Command, while similar arrangements are made for the training of transport and coastal elements with Transport and Coastal Commands respectively. The Tactical Air Force in Germany (B.A.F.O.) and the mainly tactical air formations of Middle East Air Forces and Far East Air Forces therefore receive their pilots and crews already converted to the particular type of aircraft which they will fly in operations. Apropos the subject of Tactical Air Forces, Marshal of the Royal Air Force Sir John Slessor, Chief of Air Staff, speaking at the Mansion House to a gathering of the Air League of the British Empire on April 19, 1951, said:

To-day the Royal Air Force has one particular commitment far heavier than any it had in the days before the 1939-45 war—the British share in the

integrated Air Force under General Eisenhower for the defence of Western Europe. People are far too prone to think and speak of European defence in terms of divisions. There must be divisions, but the outstanding lesson of the last war campaigns—a lesson reinforced by events in Korea—was that a campaign on land was a two-fisted affair, one fist being on the ground and the other in the air. The present great expansion of the R.A.F. includes in full measure our contribution to General Eisenhower's "fist in the air"; the relative expansion of the British Tactical Air Force in Germany far exceeds that of any other component of the Air Force. Under our latest plans, the British Air Forces at the disposal of the Supreme Commander will be the largest single component of the R.A.F.

Let us then examine the main operational roles of the Royal Air Force, and the operational training that these roles will entail.

MAIN OPERATIONAL ROLES OF THE ROYAL AIR FORCE

STRATEGIC BOMBING

Bomber Command Headquarters is located at High Wycombe, Buckinghamshire. It has two subordinate groups, No. 1 Group, Bawtry, Yorks, and No. 3 Group at Mildenhall, Suffolk, and is equipped with Lincoln, Mosquito, and (B.29 Boeing Superfortress) Washington aircraft. Bomber Command must be the main striking force of the Royal Air Force—Britain's straight left, as Marshal of the Royal Air Force Lord Tedder has described it. At the end of World War II Bomber Command comprised over 100 squadrons; the Lincoln aircraft, which had been designed primarily to give a greater range than the Lancaster and thus permit attacks over greater distances, was just coming into service.

At the present time all existing Lancaster squadrons in the greatly reduced Bomber Force have been re-equipped with either the Lincoln or the Washington; the latter aircraft formed an allocation of seventy aircraft made to Great Britain under the American Military Aid Programme. The Lincoln has an operating ceiling of between 26,000 and 27,000 feet and was designed to carry war loads of approximately 14,000 lb. for ranges in the region of 3,000 miles, and with the Washington, which has an all-round superior performance, it now comprises Bomber Command's main offensive strike aircraft. The Mosquito is the present mainstay of the target-locating and marking element of the Command. Well proven as a target-marking aircraft and as a bomber, it continues to give sterling service in these vital roles. The speedy Canberra twin-jet aircraft built by the English Electric Company will, however, be used to re-equip some R.A.F. light bomber squadrons in the near future. There is every indication that with its greatly improved performance and characteristics it will, in the jet age, perpetuate the tradition established by the Mosquito in the many roles in which this fine aircraft has been employed. The vital function of supplying photographic reconnaissance in Bomber Command rests also with the Mosquito. Operating at high altitude and equipped with special cameras, the Mosquito will probably be assisted in the future by the Meteor P.R.10 which has been developed from the Meteor fighter specially for Photographic Reconnaissance duties.

Bomber Command is at present, and will be for some time, primarily a tactical bomber force. This limited policy has been forced on the R.A.F. and does not represent a permanent policy, as is evidenced by the fact

that an order has already been placed for British four-engined jet bombers which in due course will replace the Lincoln and the Washington. With the cost of the projected heavy jet bomber being in excess of that sum which a destroyer would have cost in the period prior to World War II, there is little prospect that in peace-time the size of Bomber Command will ever approximate to that of the bomber force existing at the end of the last war. With the atomic weapon, however, there is little doubt that the new British heavy bombers will have a striking power vastly superior to that wielded by the bombing fleet in 1945. For the time being the ability to strike back at any aggressor with the bomber is confined, in the main, to the United States Air Force. Bomber Command, however, ensures that its present forces are capable of striking effectively at objectives to the limit of their radius of action by night and by day. Further, if the force is to be efficient it must be capable of so doing at short notice; it must be mobile, enabling it to be used as a reinforcing element to other theatres, and it must be capable of operating from other conditions of climate and terrain with maximum efficiency if its full effectiveness is to be brought rapidly to bear on an aggressor. The Command's primary function of strategic attack, and its present secondary functions in support of the other Services require a high standard of navigational ability and bombing accuracy if the full effectiveness of the force is to be achieved; further, the ability to operate accurately by night requires that all available navigation and bombing aids be exploited to the maximum. The force is therefore practised in the special methods and tactics required, and by constant exercising is maintained as a highly qualitative force with the present available equipment.

HOME DEFENCE

Fighter Command Headquarters is at Stanmore, Middlesex. It has two subordinate formations, No. 11 Group at Hillingdon, Middlesex, and No. 12 Group, Newton, Notts; and it is equipped with Vampire F.3 and F.B.5, Meteor F.4 and F.8, Hornet F.3, Mosquito N.F.30, 36, Spitfire F.R.14, L.F. 16 and 21, F.22, and Auster 6.

Its role is the defence of the United Kingdom against air attack. Its primary function is therefore to destroy by day or by night the maximum number of attacking enemy aircraft. To this end the Command co-operates with Anti-Aircraft Command, which is under the operational control of Fighter Command. The Royal Observer Corps and the Fighter Control Units also provide an essential part of Fighter Command's defensive network. Fighter Command is responsible for the training of specific squadrons in tactical support of the Army; during war it would also be responsible for the protection of coastal shipping. The Air Observation Post squadrons equipped with Auster aircraft, are also located in Fighter Command. Used for Artillery spotting and flown by Royal Artillery pilots, they are under the operational control of the Army but administered and maintained by the Royal Air Force.

The main interception aircraft of Fighter Command are the Meteor 4's and 8's; existing Vampire 3's are being replaced by the Vampire 5 F.B. Re-equipment of the twenty Royal Auxiliary Air Force squadrons, an integral part of the front line, with Meteors and Vampires is well in hand. The long-range fighter Hornet 3 continues in use. All new fighters on

order, however, have greatly increased fuel tankage, and their radius of action will be correspondingly greater. The Mosquito night fighters, N.F.30 and N.F.36, remain in use but will in due course be replaced by the Meteor night fighter, Mark II.

DEFENCE OF SEA COMMUNICATIONS

Coastal Command Headquarters is at Northwood, Middlesex. Its subordinate formations are: No. 18 Group, Pitreavie Castle, Dunfermline; No. 19 Group, Mount Batten, Plymouth; and R.A.F. Gibraltar. Its aircraft comprise Lancaster G.R.5, Hastings (Met.) and Halifax (Met.) 6, and the Sunderland G.R.5.

The role of Coastal Command is to ensure the safety, in conjunction with the Royal Navy, of our sea communications. This task not only calls for closely integrated training with the Royal Navy but the achievement of a high degree of accuracy in the execution of the various tasks that it entails. The Command is responsible that its units are capable of finding and shadowing enemy surface vessels and passing the information thus gained to our own ships, thereby enabling contact to be made; of locating and destroying enemy submarines by day and by night with and without the aid of surface vessels. Convoy escort absorbs the attention of other units, and the Air/Sea Rescue organisation is centrally controlled by the Command. The provision of aerial Meteorological Reconnaissance falls to Coastal Command, and the daily periodic reports on weather data from aircraft of Coastal Command go to provide one of the many sources from which the Meteorological Office compiles its forecasts. As with other Commands, Coastal Command is required to co-operate with other R.A.F. Commands and Air Forces in joint operations, and with the Army and Royal Navy in all that the successful presecution of maritime operations requires.

Currently, the Lancaster and the Sunderland bear the brunt of the anti-submarine, escort, and reconnaissance duties of Coastal Command, while the Halifax (Met.) 6 and Hastings (Met.) aircraft, operating from Northern Ireland and Gibraltar, provide data for meteorological purposes. The Lancaster is also available for air/sea rescue duties and carries the airborne lifeboat, fitted with an 8-h.p. water cooled marine engine, for jettisoning in the sea to crews in distress. A further development of the Lincoln, the Avro Shackleton G.R. Mk. I, is now in production for Coastal Command as a land-based reconnaissance bomber. The Shackleton will be powered by Griffon 57 engines instead of Merlins, which will give it considerably more power than its predecessors; it is fitted with counter-rotating airscrews. Orders have also been placed for the Neptune P.2 V.5 twin-engined maritime reconnaissance aircraft.

TRANSPORT ROLE

Transport Command is located at Upavon, Marlborough, Wilts, and is equipped with Hastings, York, and Valetta aircraft, and Horsa and Hamilcar gliders.

This Command is charged with the carriage of personnel and equipment within the United Kingdom and between the United Kingdom and

Commands overseas for the Royal Air Force and other Services. It also is responsible for the air transport side of airborne assault and air supply operations. Another function that the Command performs is the delivery of Service aircraft to and from overseas Commands. To carry out these functions the activities of the Command can be grouped conveniently into three elements, viz. the long-range transport force (Hastings and York aircraft), the medium-range transport force (Valetta aircraft), and the aircraft ferrying organisation. The training functions of the Command are therefore: (i) to train squadrons for long-range transport operations of a global nature; (ii) to train squadrons of the medium-range force, in co-operation with the Army, in the mounting and execution of airborne assault and supply operations; and (iii) to train crews capable of ferrying military aircraft to and from the overseas Commands. Added to these training requirements is the further requirement to develop training in all aspects of military air transport in conjunction with other Royal Air Force Commands, Air Forces, and the Army and Navy. The inspection of those elements of the transport force located in overseas Commands is delegated to the Commander-in-Chief, Transport Command, who, in his capacity of Inspector of Air Transport Services, is responsible for the inspection of the air transport trunk routes and is required to advise Commanders-in-Chief of overseas Commands on those problems arising from the training and operation of overseas-based transport forces.

TACTICAL ROLE

All elements of an Air Force may from time to time be engaged in the support of a land campaign. The principal part, however, is normally played by the Tactical Air Force, which is a composite formation including light bomber, fighter (equipped and used for air fighting and ground attack), and reconnaissance squadrons. If air co-operation is required for a particular operation, over and above that which the Tactical Air Force is able to provide, then the Tactical Air Force commander presents his requirements to the Air Commander-in-Chief of the theatre, or other superior authority as appointed, for additional forces to be put under his control for the purpose of the operation.

The role of the British Air Forces of Occupation is to provide the Tactical Air Force in conjunction with the other Allied Air Forces for co-operation with the Land Forces placed under the control of General Eisenhower.

The Headquarters of B.A.F.O. is at Bad Eilsen, Germany. The Command is composed of No. 2 and No. 85 Groups, the former Group being the Operational Group and the latter the Maintenance Group. The aircraft under its control are composed of Mosquito (B.6 and 16, 35, and F.B.6), Spitfire F.R.14 and 18, P.R.19, and the Vampire F.B.5 aircraft. The Vampire F.B.5, with which the fighter squadrons are equipped, is also used for ground attack and is capable of carrying bombs or rockets. The light bomber squadrons are equipped with the ubiquitous Mosquito, and the various reconnaissance requirements are met by use of the Spitfire F.R.14 and 18 and the P.R.19. B.A.F.O. is required to co-operate with all R.A.F. Commands and other Air Forces and with the Army and Navy. An example of the flexibility in its organisation and co-operation with the

Army and other R.A.F. Commands was shown by the mounting and successful operation of the Berlin Airlift.

The Headquarters of the Middle East Air Forces is located at Ismailia, Egypt. The Command covers a vast area and comprises No. 205 Group, Fayid, Egypt; Air Headquarters, Malta; Air Headquarters, East Africa; Air Headquarters, Iraq; and Headquarters, British Forces, Aden. It is equipped in the main with tactical aircraft, but is reinforced continually by Bomber Command squadrons which come out for a month at a time for armament and navigational training to Shallufa in the Canal Zone. The Middle East Command aircraft comprise Vampire 3 and F.B.5, Spitfire F.R.18, Brigand B.1, Mosquito N.F.36 and P.R.34, Valetta C.1, Lancaster G.R.3, and the Auster 6. The Command is therefore responsible for the efficient maintenance and training of Tactical Air Force, maritime, bomber, and transport forces, and co-operates with the Army and Navy to ensure that land/air warfare, maritime, and all other operations are prosecuted with maximum efficiency under prevailing local conditions. The Command contains several air bases which are important to Middle East strategy and strategic air routes.

Headquarters, Far East Air Forces, is at present Changi, Singapore, and its subordinate formations comprise Air Headquarters, Ceylon; Air Headquarters, Malaya; and Air Headquarters, Hong Kong. It is equipped with Vampire 3 and 5 F.B., Brigand B.1 and Met.3, Dakota C.4, Mosquito P.R.34, Spitfire F.18, F.R.18, and F.24, Valetta, Sunderland G.R.5, Tempest F.2, and Auster 6 aircraft. The Command in conjunction with the Army and Navy is responsible for the protection of British interests throughout the area. At present the Command is actively engaged in the war against Communist bandits in co-operation with the Army and Police. Although the use of aircraft is limited under jungle conditions, Brigands, Spitfires, Tempests, and Vampires have been used in reconnaissance duties and air strikes against the bandits. Sunderland and Harvard aircraft have also been used on occasions for bombing. The Command was further reinforced by Lincoln squadrons for bombing duties during 1950. Transport units have steadily maintained air supply of troops and police engaged on jungle patrols. Helicopters are being used with great success for the evacuation of casualties. The type in use is the Westland-Sikorsky Dragonfly Mark 2 rotorcraft fitted with a stretcher on each side of the fuselage to which casualties are strapped. The Command is responsible for the efficient conduct of maritime air operations and land/air warfare operations together with its Naval and Army counterparts, and for main-training air transport and supply facilities to meet the requirements of the Services in the Command. In Hong Kong the air forces have been reinforced during the year to counteract possible Communist aggression from the mainland.

OPERATIONAL TRAINING

The operational training of the pilot and crew on leaving the O.C.U. ensures that they are competent to carry out all tactical manoeuvres in their aircraft. On arrival in a squadron the pilot and crew find that they are faced with an annual training programme which exercises them in every possible function of the aircraft with which the unit is equipped. Air

firing, bombing, and rocket attack are carried out with practice and live ammunition, bombs, and rockets under varying conditions and practice ranges. Squadron, Wing, Group, and Command exercises are held. Further intensive armament training takes place when each squadron attends armament practice stations at established periods throughout the year. Practice in the role of support of the other Services is obtained at all levels and demonstrations of fire power given to the other Services. Typical of these demonstrations are those arranged by the School of Land/Air Warfare at Old Sarum and attended by officers of all Services; or the B.A.F.O. air demonstration held on June 20, 1950, where aircraft of all roles in B.A.F.O. demonstrated their various abilities together with F.80 aircraft of the U.S.A.F. and aircraft of the Royal Navy. Throughout the year every opportunity was taken to give all Tactical Air Force elements the maximum practice with their corresponding Army formations. Interception and fighter affiliation exercises were constantly arranged between aircraft of the various Air Forces based in U.K. and on the Continent. On the successful conclusion of the delivery over a route of 8,850 miles of Vampire jet fighters to re-equip fighter squadrons of the Far East Air Force, the Chief of the Air Staff, Marshal of the Royal Air Force Sir John Slessor, sent the following message to the Air Officer Commanding-in-Chief, R.A.F. Transport Command, Air Marshal Sir Aubrey Ellwood:

Please convey my congratulations to all who have played a part in the F.E.A.F. Vampire ferry operation. This operation (in all probability the longest of its kind undertaken with jet aircraft) has been completed according to schedule and without serious mishap. This reflects great credit on air and ground personnel alike.

All concerned may rest in the knowledge that they have partaken in an experiment which has shown that modern fighter aircraft can be ferried over long distances through all types of weather conditions. In consequence of this the mobility and flexibility of our jet fighter force has been greatly increased.

The forty-four Vampires staged through airfields in eleven countries between R.A.F. Station, Chivenor, Devon, and R.A.F. Station, Changi, Singapore. Ferry pilots of Transport Command flew them to Fayid, in the Suez Canal Zone, by way of Dijon, Istres (France), El Aouina (Tunis), Castel Benito (Tripoli), and El Adem (Libya).

At Fayid they were assembled into convoys of six aircraft each and flown on to Singapore by the ferry pilots and pilots of the Middle East Air Force. The convoys were escorted by Mosquito aircraft, to give navigational assistance, via Mafraq (Jordan), Habbaniya (Iraq), Bahrein, Sharjah (Persian Gulf), Mauripur (Pakistan), Palam, Kanpur, Barrackpore (India), Mingaladon (Burma), Don Muang (Siam), and Butterworth (Malaya), to Changi. The first six Vampires to reach Singapore from the United Kingdom logged a flying time of just over twenty-seven hours.

Before the operation the route was surveyed and arrangements were made with the co-operation of the Governments of the countries concerned for servicing and re-fuelling where necessary.

The Royal Air Force attaches great importance to the mobility of its striking power and to flying being undertaken under operational conditions in all climates. The limited range of jet fighters gave rise to new problems in this field, but valuable experience was gained in 1948 when Vampires of No. 54 Squadron made history by completing the first jet crossing of the

Atlantic. Bases were set up along the 3,540-mile route at staging points in Stornoway, Iceland, Greenland, and Labrador. The technique of a navigational escort of Mosquitoes was proved in that operation. This mobility of British-built jet aircraft was strikingly demonstrated recently by the non-stop flight of a Canberra from Northern Ireland to Newfoundland, which broke all records for trans-Atlantic flights. The North Atlantic flight, of course, presented weather problems very different from the tropical and sub-tropical conditions faced by aircraft flying to the Middle and Far East.

In the spring of 1948 the R.A.F. showed that it could at short notice send a striking force to the other side of the globe. In Exercise "Red Lion" a complete self-contained bomber squadron, No. 97, accompanied by transport aircraft carrying its ground crew and equipment, was flown 7,300 miles to Malaya as a test of mobility and to gain experience of rapid re-inforcement of the Far East.

The experience gained in "Red Lion" was put to good use when it became necessary a year ago to send to Malaya a Lincoln bomber squadron to add its weight to the campaign against the bandits. In order to widen Bomber Command's familiarity with conditions in the Far East, the Lincoln squadron doing duty in Malaya has since been changed several times.

The summer of 1948 also saw the start of another mobility and re-inforcement exercise for Bomber Command—the monthly "Sunray" to the Middle East. Every bomber squadron has now had at least one "Sunray" and on several occasions two squadrons have undertaken the exercise at the same time. Accompanied by a marker force of Mosquitoes, the Lincoln squadrons frequently fly non-stop the 2,000 miles to Shallufa, in the Canal Zone, their ground personnel travelling in transport aircraft. A fully combatant squadron is expected to take the air within a few hours of arrival at Shallufa. The month's intensive training includes live bombing practice and air firing on nearby desert ranges, fighter affiliation exercises with squadrons of the Middle East Air Force, and long-distance navigational and bombing missions to Iraq, the Sudan, the Arabian Desert, and Cyprus, some involving reaching targets 1,000 miles from base. In its "Sunrays" Bomber Command has shown that extreme mobility can be achieved without loss of operational efficiency.

Coastal Command has also sent squadrons overseas in operational exercises to co-operate with naval units in the Middle and Far East. Lancasters of R.A.F. Coastal Command took part in a goodwill visit to Pakistan.

While in Pakistan the aircraft participated in the Quetta Staff College combined operations exercise. During this exercise the Lancasters carried out interceptions, shadowing and simulated bombing of naval units, and also took part in affiliation with Royal Pakistan Air Force fighter aircraft. The Lancasters were based at Mauripur (Karachi) and also visited Peshawar. Sunderland flying boats have played an important role in the maritime aspect of the Korean war.

In all these moves Transport Command has provided the essential backing. Its Hastings aircraft have recently extended the normal Far East trunk route services beyond Singapore as far as Hong Kong and Japan, doing an important job in carrying reinforcements for the British

contingents in Korea, and returning with casualties from several other United Nations forces engaged there.

Operational problems in Polar regions have not been neglected. Aircraft from the Air Navigation School and the Royal Air Force Flying College at Manby have made a number of flights in the Arctic and have also flown over the North Pole. In co-operation with the Royal Canadian Air Force the R.A.F. have gained experience of cold-weather tests of aircraft and equipment at the Winter Experimental Establishment at Edmonton, Alberta, and also in Alaska and northern Norway.

The experience gained at all levels by the foregoing operational training is utilised in mounting the major inter-Command and inter-Service exercises which test not only the quality and efficiency of the forces engaged but their organisation and other problems of command.

EXERCISES

During 1950 the following major exercises were held:

HOME FLEET SPRING CRUISE (February 28 to March 12)

Aircraft of Coastal, Fighter, and Bomber Commands together with aircraft of Naval Aviation took part in a maritime exercise with the Home Fleet. Lincolns of Bomber Command carried out high-level attacks on the Fleet while aircraft of Fighter Command provided the intercepting force. Lancasters and Sunderlands of Coastal Command provided pro- and anti-submarine patrols, and search and shadowing operations. A squadron from Coastal Command was detached from U.K. to Malta to take part in exercises with the Fleet.

EXERCISE "SCAPA" (May 9-11)

Integration of artillery and air support with aircraft of Fighter Command and B.A.F.O. taking part, at the School of Artillery, Larkhill. Demonstration of relative effect of artillery fire and air/ground attack. This is the largest display of artillery fire annually staged in the United Kingdom. Various aircraft demonstrated live cannon, dive-bombing, and rocket attacks; light bomber aircraft bombed under M.R.C.P. control (Mobile Radar Control Post).

FLAG OFFICER SUBMARINES SUMMER WAR (June 1-17)

Forces of the R.A.F. and R.N. took part in an exercise in pro- and anti-submarine operations. R.N. and R.N.V.R. Fireflies, Mosquitoes and Seafuries, together with Lancasters and Sunderlands of Coastal Command, and Convair P.B.4 Y Privateers of the U.S. Navy, provided defending and attacking aircraft. Naval forces taking part included about sixteen submarines, of which two belonged to the Royal Netherlands Navy. The exercise was divided into four phases. Phases 1 and 2 were devoted to deployment and attacks on the Fleet in the North-West Approaches. Phase 3 consisted of independent Fleet units being hunted by submarines with aircraft in close support. Finally, the exercise concluded with combined attacks by submarines and aircraft on a fast ocean convoy sailing with a carrier task force.

(June 1)

Aircraft of Fighter Command and B.A.F.O. demonstrated at Leuchars to Scottish Command:

- (a) Armaments carried by ground attack aircraft.
- (b) The Air Contact team and "Cab rank" in operation with live cannon, rocket, dive-bombing, and light bomber attacks.

(August 7-11)

Aircraft of Fighter Command and B.A.F.O. demonstrated to Northern Command a large-scale ground attack including light bomber attacks in close support.

EXERCISE "CUPOLA" (August 25-27)

Exercise Cupola was held to test the air defence system of the Western Union Air Forces and its control and reporting systems. Vampires, Spitfires, and Mosquitoes from B.A.F.O., Wellingtons and Mosquitoes from Flying Training Command, and Meteor and Vampire fighters of Fighter Command based at Coulommiers (France) and Twenthe (Holland) took part. The French Air Force element was composed of Vampire and Thunderbolt F.47 fighters operating from Villacoublay and St. Dizier. Belgian and Dutch Meteors and Spitfires and Belgian Mosquitoes also participated. U.S.A.F. B.29 aircraft together with R.A.F. Wellingtons and Mosquitoes and French F.47's provided the attacking force. Air Chief Marshal Sir James Robb, Air Commander-in-Chief, Air Forces, Western Europe, stated at the conclusion of the exercise that "Cupola" had been of great value in showing that the training and organisation of the composite defence force had been on the right lines. There was, however, he stated, no time for complacency and all had not yet been done to complete the air defence system. Much could be done by adaptation, but there were certain basic channels of communication which must be provided, and that the money to do so must be found to provide an air defence system second to none. He pointed out the dangers of false economy and stressed the need for further airfields on the Continent suitable for the operation of jet aircraft.

EXERCISES "BROADSIDE" I AND II (September 24-30)

These exercises took place between B.A.O.R. and B.A.F.O. in Germany. The Army aims in these exercises were to practise (i) movement and concentration in the face of enemy air superiority, and (ii) operations on wider fronts entailing movement laterally and from front to rear and quick concentration for attack and dispersion afterwards.

The R.A.F. aims were (i) to practise locating and attacking troop movements in rear of the battle area, and (ii) to practise close support.

In order to achieve these aims the exercise was divided into two parts:

Part I. The movement of Army formations by rail and road into the battle area in the face of air opposition. This part was known as "Broadside I."

Part II. The exercise of Army troops in the contact zone, and close support of the Army by the R.A.F. This part was known as

"Broadside II." Aircraft taking part were provided by the R.A.F. and the Navy and comprised Mosquito 35's, Vampire 5's, Spitfire 14's and 19's, Sea Hornets, and Firebrands. Elements of the R.A.F. Regiment also took part. Ground formations taking part were one British Armoured division and one Infantry division, a Belgian independent brigade group, a battalion of an United States Infantry regiment, and a Danish battalion and reconnaissance squadron. This exercise was the culmination of many smaller exercises that had taken place during the year between units of B.A.F.O. and B.A.O.R. and other Allied units.

EXERCISE "EMPEROR" (October 7-15)

Exercise "Emperor" involved about 1,000 aircraft, and was the largest post-war exercise held in the United Kingdom. Its primary object was to give practice to both defending and attacking forces. The defensive forces commanded by Air Marshal Sir Basil Embry, Commander-in-Chief Fighter Command, were composed of R.A.F., R.Aux.A.F., R.N., and R.N.V.R., U.S.A.F., Danish, Dutch, Belgian, and Norwegian fighter squadrons, A.A. units of Anti-Aircraft Command, the Royal Observer Corps, and Fighter Controller units. The attacking forces under Air Marshal Sir Hugh Lloyd, Commander-in-Chief Bomber Command, were made up of aircraft of Bomber Command, the U.S.A.F., B.A.F.O., and Flying Training Command. Great value was obtained from the exercise and results achieved showed that the various changes in organisation, methods of control, and operational techniques were fully justified and that they would go a long way in modernising the air defence system.

HOME FLEET AUTUMN CRUISE (November 7-18)

Aircraft of Bomber, Fighter, and Coastal Commands together with aircraft of Naval Aviation took part in a maritime exercise which involved locating and shadowing by Sunderland and Lancaster aircraft; attacks on the Fleet by aircraft of Bomber Command; and interceptions of the attacking force were carried out by R.N. aircraft and Fighter Command Vampires. Mosquito P.R. aircraft flew high-level P.R. sorties. The passage of a convoy was provided with escort; and pro- and anti-submarine patrols by Lancasters, Sunderlands, and Barracudas; it was shadowed by other Lancaster and Sunderland aircraft in support of submarines. Shore-based Naval strike aircraft also attacked the convoy.

HOME FLEET AUTUMN CRUISE—RETURN TO U.K. PORTS (December 4-6)

Lancasters, Sunderlands, Sea Hornets, Fireflies, and Furies of Coastal Command and Naval Aviation took part in pro- and anti-submarine and search and shadowing exercises on the return of the Home Fleet from the Autumn Cruise to United Kingdom ports.

THE ROYAL AIR FORCE DISPLAY

The Royal Air Force Display held at Farnborough at the end of the first week in July provided 70,000 of the public on the first day, and over

100,000 people on the second day, with an opportunity of seeing the standard of training prevailing in the R.A.F. Individual aerobatics, synchronised aerobatics in formation, rocket firing, and every aspect of the R.A.F.'s work were illustrated on aircraft types at present in service. New-type aircraft not yet in general use in the R.A.F. were demonstrated, and among these were the English Electric Canberra, the De Havilland Venom, the Meteor N.F.11, the Hawker P.1081, and the Supermarine 510. The display culminated in a mass fly-past of Sunderlands, Lincolns, Washingtons, Dakotas, Hastings, a Valetta, a York, and a Canadian North Star representing Coastal, Bomber, and Transport Commands; the U.S.A.F., the R.C.A.F.; the R.A.A.F., the S.A.A.F., the R.N.Z.A.F., and the R.I.A.F. Harvards then flew over the Royal Box in a "G.R. VI" formation in salute to His Majesty the King and the Royal Party. The second half of the fly-past, composed of Vampires, Meteors, Hornets, and Spitfires of Fighter Command, Furies of the Pakistan Air Force, and Vampires and Meteors of the French and Belgian Air Forces respectively, brought to an end a striking display of operational efficiency adjudged on all sides as making up the best Royal Air Force Display ever held.

EXERCISES PLANNED FOR 1951

The principal exercises planned for 1951 in which aircraft will participate are as follows:

- (i) Army exercise with Air support with Middle East Land Forces and Air Forces.
- (ii) Exercise "Ombrelle" is to be held for three days at the end of May. British, French, Belgian, Dutch, Danish, and United States aircraft will take part and will be under the control of Lieut.-General Lauric Norstad, C.-in-C., Allied Air Forces, Central Europe. The object of the exercise is to set up and exercise the tactical control and reporting system in Europe, and is a logical follow-up to Exercise "Cupola" held during 1950. The exercise will indicate the state of preparedness, efficiency, and development of the Air Forces assigned to defend the Central European area under General Eisenhower and will also explore arrangements for the co-operation of the Allied Defence Forces.
- (iii) Three exercises to test arrangements for command and control of a brigade group scale assault.
- (iv) Annual B.A.O.R./B.A.F.O. manœuvres (similar to Exercises "Broadside" I and II).
- (v) A major air defence exercise, which will be the principal R.A.F. exercise during 1951.
- (vi) An air defence exercise to test the M.E.A.F. fighter defence organisation.
- (vii) Exercise to co-ordinate the operations of B.A.F.O. and Continental air defence forces including the Occupation Air Forces of the United States and France.
- (viii) N.A.T.O. convoy movement exercise.
- (ix) Home Fleet Autumn Cruise.

In addition, Fighter Command and B.A.F.O. will provide demonstrations and tactical co-operation with the principal Army Commands and lower formations throughout the year, and also will give periodic demonstrations at the School of Land/Air Warfare, Old Sarum.

Events in 1950 have shown that the operational training in the Royal Air Force is based on sound principles and that it is in a healthy state. The establishment of Supreme Headquarters, Allied Powers, Europe, with General Eisenhower as Supreme Commander, has pointed the need for co-ordination and standardisation in training and techniques throughout the N.A.T.O. Air Forces. The creation of a large Tactical Air Force in Europe and the expansion within this role have provided heavy training commitments in all N.A.T.O. Air Forces. Exercises within 1951 are therefore designed specially to weld these Air Forces into an efficient and hard-hitting composite force capable of supporting Land Forces to the maximum of striking power. Fighter Command is being expanded and re-equipped with the latest available aircraft, as will be Bomber Command in due course as the four-engined jet bombers become available from production. Transport and Coastal Commands have fulfilled their functions and displayed their ability to improvise successfully when called on to attain specific tasks. As with operational training, initial flying training requires standardisation and integration. Accordingly an Inspector-General of Air Training, Western Union, was appointed to further these functions in November 1950. Originally established to cover the training of Western Union Air Forces, the scope of the Inspector-General may well be further extended to those Air Forces of the countries forming the northerly and southerly regions of the N.A.T.O. nations. The western Union Examining Squadron operates under the direct control of the Inspector-General and is composed of British, French, Belgian, and Dutch flying instructors reporting direct to the Inspector-General and his combined staff. This squadron has been the principal medium through which standardisation and co-ordination of flying training is being achieved, and is an important factor in raising proficiency within the Air Forces of the signatories to the Brussels Pact. The aim of all training in the Royal Air Force and the other North Atlantic Treaty Organisation Air Forces, therefore, is being directed to one end: to produce pilots and crews trained fully to the highest standards and capable of taking their place in front-line units, either in the force that will comprise General Eisenhower's "fist in the air" or in such other roles as may be directed to sustain the ability of the N.A.T.O. powers to strike back against an aggressor and thus provide the best safeguard for future peace.

"AJAX"

CHAPTER XXIX

MANNING THE ROYAL AIR FORCE

A TRANSFORMATION in the manpower situation of the Service took place in the later months of 1950 and the early part of 1951. Three influences were, in the main, responsible for it. One was the improved scales of pay common to all the Services. Another was the increase in the length of service for National Service entrants, also common to the three Services. The third was the introduction of a new trade structure designed to provide an additional means of advancement for all tradesmen and so to afford a career within the Service for good technicians whether they have the qualities required in good N.C.Os. or not. This change was exclusive to the R.A.F. As the R.A.F. approached its prescribed strength more quickly than the other Services, this prospect of trade advancement must be presumed to have been the chief factor in attracting recruits. The result of all three changes was that before the middle of the year 90 per cent. strength had been obtained in most trades. Another remarkable fact was that about 50 per cent. of the National Servicemen were volunteering, on call-up, for Regular Service for three or four years instead of their two-year period of National Service.

So large a measure of success in an expanding Service can be taken to mean not only popular approval of a new system but skill in commending it to prospective entrants. Its appeal to youths called up for two years of National Service appears to be threefold. They can engage as Regulars for a minimum period of three years. By doing so they receive the higher rate of pay of the Regular from the start of their training. That strikes many as a high reward for an extra year of service. Two other considerations affect their decision. As Regulars they are allowed to choose their trade, subject to suitability and vacancies; and for entry into some of the trades there is keen competition, so that the advantage of popular appeal operates. Many youths are also attracted by the idea of becoming skilled in a trade different from that in which they have worked as civilians and so of having an additional or alternative asset on their return to civil life. The joint effect of these incentives is reflected in the high proportion of National Servicemen who enlist as Regulars.

Suitable National Servicemen are eligible for aircrew service, and for them, too, the processes of entry are made as easy and attractive as possible. They can know their fate well before the date when they are due to be called up. Under a system of "pre-assessment" they can present themselves at the age of 17 at the selection centre and discover in advance whether or not they fulfil the requirements for aircrew training. Those selected as pilots or navigators are promoted on successful completion of initial training (a period of about twelve weeks for National Servicemen) to the rank of Acting Pilot Officer on probation. This again represents an acceleration in the progress of the trainee. Pre-assessment is found to commend itself strongly to those who are keen to become members of an air crew but are not anxious to serve in a ground capacity.

It is also popular with parents who are concerned with the early planning of a son's career.

Throughout the year about sixty candidates a week were being interviewed for pre-assessment and no limit was being set on the number of candidates. Those found suitable for aircrew training had three choices. They could elect to do only the prescribed two years of their National Service, or they could extend that to four years Regular Service, or they could, if they wished, volunteer for a short-service engagement of eight years' Regular service, which carries a higher initial rate of pay, or, if eligible, could apply for a cadetship to the R.A.F. College at Cranwell for training for a permanent commission.

The policy of commissioning all pilots and navigators who successfully complete initial training has not been allowed to make selection completely rigid, for those who do not come up to commissioning standards in training can still elect to be pilots—in N.C.O. capacity. Nor are the selection processes so inflexible as to forbid the borderline cases a re-examination and a fresh consideration of their qualities. This is a sensible attitude in a Service which so assiduously cultivates the sources from which suitable youths can be expected to come.

There are, for instance, liaison officers in touch with the schools. At the better-known public schools these are old boys, all of the rank of Group Captain or higher, who give periodical advice at their old schools to the current generation. Visits to the grammar schools and secondary schools are made by other officers, who give talks and show films. These efforts are backed by a readiness on the part of the Royal Air Force to try to arrange that school friends, entering together for National Service shall train together as far as possible. In a variety of ways the Service has shown itself willing to treat entrants as individuals and to accommodate itself within certain principles to personal desires. Combined with the readiness to give the borderline examinee a second chance and allow him to prove himself in training, this is evidently stimulating the inflow of aircrew types.

For National Servicemen there are now about 3,000 vacancies a year in aircrew categories. All aircrew—whether National Service or Regular—now receive flying pay in addition to their basic pay.

Cadets receive flying pay during instruction at the rate of £55 a year after six months' training. The rate rises to £128 on confirmation in the rank of Pilot Officer, and again to £146 on promotion to Flying Officer. On promotion to Flight Lieutenant flying pay is advanced to £164 a year, and at that rate it helps to swell his income until, at the rank of Wing Commander, it falls to £91. There is no flying pay for Air Commodores or officers of superior rank.

The basic pay of the Pilot Officer is £319 (for National Service officers who have not completed 18 months, £237) and is increased to £529 when he reaches the rank of Flight Lieutenant, which he can expect to do after five or six years' service. If he is married he receives £146 a year in marriage allowance, which is increased to £338 when he reaches the age of 25. In addition, he receives his flying pay, so that a married flight lieutenant aged 25 has a total income of £1031.

Apart from flying pay, the new rates of basic pay represent a notable increase. For junior officers it amounts to £82 a year and applies to most

branches. It has helped to remove a sense of grievance within the Service, which persisted since 1946 when the last revision of pay took place and marriage allowances were made subject to income tax. It has also made commissioned service more attractive to prospective entrants. The corresponding improvement in airmen's pay has likewise removed a suspicion, widely held in the past, that the Service did not pay "the rate for the job." The recruit's pay is now 49s. a week. It rises as he progresses to A.C.1, L.A.C., and Senior Aircraftman, and it can go on rising beyond that point either by the normal process of promotion to N.C.O. rank or through the new technician channel. This provides acknowledgment of increasing skill and experience as a tradesman without the assumption of administrative responsibilities.

Every advance up the technicians' ladder to Junior Technician, Corporal Technician, Senior Technician, and Chief Technician carries an increase in the rate of pay. The last three grades correspond broadly in status to the usual N.C.O. ranks of Corporal, Sergeant, and Flight-sergeant, and are denoted by badges of rank of the same pattern as N.C.Os. worn upside down. They represent a kind of technical aristocracy, admission to which is governed by the aircraftman's qualifying as a Junior Technician. Up to that rank he is a member of the "skilled trades"; at that rank he enters the "advanced trades" and becomes eligible both for normal promotion at the highest rates of pay and for technical advancement.

For promotion he must pass education tests as well as acquire the technical qualifications, and if he can do this in an advanced trade his income will be better than he could expect in industry. For instance, a Flight-sergeant in an "advanced trade" receives on promotion up to 150s. 6d. a week, whereas his best rate of pay at promotion in a "skilled trade" is only 133s. a week. Exciting prospects are opened to the ambitious tradesman in this new scheme, and good prospects face the able tradesman who can absorb technical knowledge but may have no taste or temperament for command. The R.A.F. is entitled to claim that it now offers its tradesman a career up to the age of 55.

The R.A.F. still cannot promise every recruit a life's career. Engagement for long service is open to aircraftmen after four years. Acceptance for long service must depend to some extent on the airman's record and promise, just as a tradesman's success in a Service career must depend on his ability to profit by the training courses and his industry in applying what he learns. For the majority of those who remain in the Service the new trade structure should lead to a sense of contentment and should therefore raise the tone of the Service. From the Air Council's point of view it has a particular advantage in affording the means of making undermanned trades specially attractive. There seems no reason why the "advanced trades" should not serve as an instrument for balancing supply and demand.

The introduction of the new system at the end of 1950 involved the re-labelling of the 180,000 tradesmen already in the Service. That was duly accomplished over a period of about three months. At the same time an opportunity was given to N.C.Os. who possessed the necessary qualifications to change over to technician grades. To make the change they were required to qualify as Junior Technicians, and N.C.Os. were presenting themselves to Trade Boards throughout the year. Scope in

the "advanced trades" is still ample, and young Regulars now coming forward can expect to find plenty of chances to advance. Some reflection of the appeal made by the higher rates of pay and the better prospects seems to be appearing in the apprentice schools where boys are prepared for service, particularly in the skilled trades. Aircraft apprentices have recently been nearly 50 per cent. below the required number. A marked improvement has taken place also in the recruitment of boy entrants. The numbers of these are now close to requirement.

In general, the R.A.F. now seems likely to be able to get the men it needs for the ground trades and is in a better position to attract the prescribed numbers of suitable entrants for aircrew. The scheme of initial training in the ground trades has changed radically since the introduction of the new trade structure. Instead of selecting one of the 130-odd trades, recruits now enter for a basic training course in one of the twenty-two trade groups and fully half of them receive their early training, as they did in the past, "on the job" as trade assistants. The progression up to the rank of L.A.C. is much the same as it was formerly. That is to say, the aircraftman acquires skill of hand but never becomes anything more than a mechanic. Under the old trade system, for example, a flight mechanic could not rise above L.A.C. without qualifying as a fitter. Under the new plan he can reach the rank of Senior Aircraftman as a mechanic. At that stage he can apply for advanced training, which will give him some detailed technical knowledge of the functions of special Air Force equipment. With his first successful test in that field he becomes a Junior Technician and has made his way into the advanced trades.

For pilots and navigators there is now an accelerated progress. Under the old regulations commissions were granted only after Regular and National Service candidates had qualified for wings, a period of eighteen or twenty months. Now, commissions are granted on successful completion of the six months' course at the initial training school (twelve weeks for National Servicemen) and are confirmed provided the candidate successfully completes flying and officer training. Promotion to Flying Officer can then be expected two and a quarter years after entry into the initial training school, and again to Flight Lieutenant (subject to passing the promotion examination) three and a half years later. These changes mark the efficiency of the selection system which seeks to discover not only the potential pilot or navigator but also the potential officer. The methods of the selection centre, at which candidates under observation lead a communal life for three or four days, are now well known. There aptitude is determined and the qualities of responsibility and leadership are detected. The candidate knows whether or not he has reached the standard before he leaves the centre. The successful ones begin their Service careers quite soon afterwards and a good proportion of these short-service officers later in their career will be selected for permanent commissions.

The way into the flying branch of the Service is no easier than it was in the past, but the way after entry has been improved for the recruit. The aim of the new scheme is to attract better quality candidates by offering them better prospects and allowing them more promptly to enjoy the additional benefits of commissioned rank. The wastage rate after

careful selection and initial training has been so low as to permit early commissioning without any serious risk of failures in flying training and officer training. In this sense the laborious post-war rebuilding of the officer corps has yielded valuable lessons for application at a time when rapid expansion became necessary. The R.A.F. is now in the fortunate position of being able to offer financial prospects fully equal to those which the young men it wants could find in civil life and to reduce the gap between entry and full enjoyment of those prospects. In fact, the period of probation is not reduced, for commissions are not confirmed until the usual eighteen months of training has passed, but the cadet who becomes an Acting Pilot Officer at the end of initial training feels he has something worth striving to retain in the subsequent year of his probationary training.

Up to the time when all these changes in pay and conditions of service were made late in 1950 the R.A.F. had been heavily handicapped in the manpower market. It had to compete with industry for the types of tradesmen it needed and for officer material. Because the period of National Service was limited to eighteen months, it was unable to make tradesmen of nearly half its strength in any year. Its supply of skilled labour was small in relation to its total strength, and this was reflected in the number of aircraft which could be kept ready for service at any moment. At the same time, it was grievously short of aircrew in consequence of the heavy curtailment of flying training in the years immediately following the war. As a defence force the R.A.F. was probably never so weak in fighting strength since it was reduced to one-tenth of its former size after the end of the 1918 war. Then, small though it was—a mere 33,000 officers and men—it remained a close-knit, highly efficient force. In the years after 1945 its nominal strength was roughly one-fifth of its war-time strength, but it was steadily drained by demobilisation of its skilled and experienced men, and it had no adequate means through recruiting to restore the balance.

With the fall in effectiveness there came a natural lowering of the spirit of the Service, accentuated among the Regulars by the influx of National Servicemen who could not be turned into tradesmen and who, for the lack of skilled men, could not be fully employed on useful duties in many instances. The National Servicemen, for their part, were largely disappointed by their brief experience of the R.A.F., and this, aggravated by the customary post-war reaction against Service life, was a deterrent to Regular recruiting in the normal age groups. The cumulative effect was to worsen the situation. Regulars wanted to get out and non-Regulars were disinclined to stay in. Meanwhile industry was swiftly resuming peace-time production in a world starved for six years of civilian products; and there was well-paid work for any young man who wanted it. The Service claimed to pay the same rate for a given job as was paid outside less £1 a week for quarters and keep. The claim on the whole was just, but it did not prove attractive, possibly because it could not compete with the possibilities of overtime earnings in industry.

Alternative attractions would have helped. The offer of married quarters would have drawn many a young man who could see no hope outside of getting a home of his own, but the Government directed that the rate of house-building in the Service should march strictly with that

of the civil authorities. The entrant was offered a trade but not in the true sense a career, although the acceptance by trade unions of Service tradesmen's qualifications was gradually spreading, and Service training was in some measure a preparation for civilian employment. Unless he could count on promotion to N.C.O., the recruit could not expect to advance throughout his whole Service life beyond the rank of L.A.C. and an income of about 63s. a week. He was reminded that he would pay less in National Insurance contributions, would have no expenses in travelling to and from his job, and could look forward to a pension if he completed twenty-two years' service. Recruits dribbled in at a rate well below what was needed, but the Service set itself with resolution to the task of turning them into skilled tradesmen and of devising a system for getting useful service out of the National Servicemen notwithstanding the shortness of their service and the lack of instructors.

One of the best ideas for seizing the interest of the National Serviceman was to introduce him to the aircraftman, about to leave the Service, whose job he would be expected to take over, and allow the two to work side by side for a few weeks. Another part of the plan was to strengthen the training organisation, drawing additional instructors from the more experienced Regulars as younger tradesmen became qualified to take their places in the squadrons. In a shorter time than might have been expected, order began to emerge once more from the chaos of the demobilisation period, the sense of frustration in Regulars and non-Regulars alike began to subside, and the Service, but for some financial discontent, recovered something of its old spirit. Yet still the intake of Regulars remained a dribble. At that point the Air Council approved the new trade structure as a means of giving the good workman the chance of a real career even if he were not possessed of the personality and authority to mark him out for promotion. With it came the big expansion programme of the Government and the improved pay scales to ensure its success, together with the lengthening of the period of National Service to two years.

Almost at once the rate of Regular recruiting was trebled, largely through the readiness of National Servicemen to take the advantages accruing from Regular service in exchange for the longer period of service. The immediate response to the new conditions of service seems to prove beyond doubt that the main obstacle in the two preceding years was economic. The removal of that handicap was beyond the power of the Service. Before the change the Air Council had done everything in its power consistent with an efficient Service organisation to make life in the R.A.F. attractive; and it had proved not to be enough. Quite clearly an expanded air defence could not have been manned on the old basis. The choice before the Government was well defined. National Service could be extended to a period of five years or better terms could be offered to volunteering Regulars. By choosing the latter method the Government secured to the R.A.F. much more in willing and contented service, and therefore in efficiency, than would have been yielded by compulsion, and the Service itself took the necessary steps to preserve the keenness of the Regular and to give him something continually to look forward to.

Lengthening National Service to two years had two main results. By

reducing the gap between the National Service term and the shortest Regular engagement it pre-disposed the youth of 18 with no educational or apprenticeship ambitions to offer himself for Regular recruitment; by affording more time for training it contributed to the quality of the training and ultimately to the effectiveness of the Reserve. The prospect now is that the R.A.F. will be able to meet its rising commitments in the ground trades as each phase of the expansion presents its manpower demands with its intake of National Service men—at about 1,000 a week. That intake is still selected with some care, for more youths offer themselves for National Service in the R.A.F. than are accepted, but it remains a somewhat unbalanced intake. Ability and aptitude for certain trades appear to be evoked rarely by the current system of standardised education; and if the Service has to do its own moulding, two years is not long enough. The improvement in Regular recruiting is therefore a boon to a Service which, with increasing aircraft speeds and new techniques, is coming to need more urgently each year a high efficiency among its individual men.

A bigger supply of Regulars can also be said to have consolidated the modern mixture of Regulars and National Servicemen. It means that the quantity of the leaven in the lump is raised. More skill and increasing experience become available not only to set the standard for the semi-skilled and less experienced but to serve too as the foundation and inspiration of the still bigger expansion which must take place if war should come. National Servicemen, after two years' training, promise also to form a more valuable pool of Reservists. Some of them now can become real tradesmen in the course of two years, and subsequent service in squadrons of the Royal Auxiliary Air Force particularly should keep their skill fresh and sustain their interest, for all the Auxiliary squadrons are equipped at last with jet fighters, mostly of recent marks.

What applies to the manpower situation of the R.A.F. does not apply to the strength of the W.R.A.F. There has not been the same marked improvement in the recruiting rate among women as among men since the better conditions of service were announced. That is hard to account for. Almost all ground trades are open to women. Theoretically, the same prospects of advancement are presented to them. If women were generally interested in careers they could now look to the Service for them. So far the attractions have been offered in vain. One likely reason is that they can easily obtain employment as civilians in close proximity to picture houses and dance halls and can as easily change their employment if it fails to afford the right social contacts and opportunities.

The Service may have allowed too grim a picture of conventual segregation to circulate among girls of the appropriate ages and laid too little emphasis on the communal occasions of station life and on the more glittering prospects of possible husbands to be found in it. The failure of the women to respond to more pay and better prospects does suggest a chance to re-examine the factors in Service life that are more important to women than a prospect stretching through years of single-blessedness. The Service had not expected many long-term engagements in the W.R.A.F., but it has reckoned on securing a steady flow of women into the Service. That need is greater with the current expansion particularly of certain trades in which delicate work must be done or an element of monotony endured; and the discovery of a formula as attractive in its

way for women as the present one seems likely to prove for men is evidently one of the desirable adjuncts of expansion.

The signs are that the W.R.A.F. is less well equipped than the R.A.F. to compete with industry and business for the labour it needs. Part of the explanation is that the W.R.A.F. has no National Service entry to tempt with offers of higher pay and more prospects into Regular engagements. In the new circumstances National Service obligations among the men serve to overcome the inertia and set their feet on the desired path. They provide much of the material, but by no means the whole, on which the R.A.F. recruiters work. Men can still enter the R.A.F. up to the age of 33, and until the rise in the cost of living forces up civilian wage rates they can now find as high a reward in the Service as they would be likely to get in industry. If living conditions on all stations were as good as those at the best, the R.A.F. might have had a temporary advantage over industry; but in some places the hutted camps remain, and in these instances comfort and recreation suffer when compared with the facilities of civilian life. The shortage of married quarters has also been keenly felt. In the current financial year contracts for some 4,000 married quarters are to be placed, and the policy is to build this number each year for four years. This is a notable increase on the building rate of other years. For the whole post-war period up to April 1951 only 4,080 married quarters had been completed. The authorities hope that the new 16,000 married quarters, as an addition to existing married quarters, will satisfy the whole of the demand in the United Kingdom. Whether that hope is realised or not, the Service will have improved its attractiveness to men with families.

The inter-relation between industry and the Service, implicit over a period of years, is now in process of being defined and acknowledged. The R.A.F. produces tradesmen which industry can use; it often absorbs tradesmen which industry has trained. That situation will persist and, while R.A.F. expansion continues, will tend to cover a wider field. The contact between the Service and industry ought therefore to be fairly close.

When industry, trades unions, and learned societies were invited in May 1949 to join with the Air Staff in the conference described as "Exercise Ariel," this mutual interest in labour was brought into the open for the first time and an attempt was made to modify the element of competition between the two. The interest of the industrialist in air defence was sought. Industrial concerns were asked to make the way into the Service easy for the patriotic young tradesman by guaranteeing his job and his promotion in that job at the end of his special three-year engagement in the R.A.F. For its part, the Service listened with respect to the views of industrialists and trade union leaders on the subject of preparing the tradesman for his return to civilian life. A number of useful ideas came out of that conference and were subsequently pursued, but its chief value was that it drew the employers and the organisers of labour close to the R.A.F. and created an atmosphere favourable to recruiting when the Service should find itself able to compete economically. That position it had reached by the beginning of 1951, and recruiting figures testified to the soundness of the preparations.

In consequence, the Service ran into its expansion programme without

lowering its trade standards, although in the new trade structure initial standards have been lowered with increased specialisation. The trade assistant or A.C.2 advances now in three steps, instead of the former two, before he can settle down to full specialisation in the advanced trades. Mechanics, in other words, can now move one more step up the ladder as mechanics and thereafter have all the opportunities of the advanced trades ahead of them. The ultimate fund of skill and knowledge in the ground trades should therefore be more ample than in former days, and the large measure of re-organisation involved in establishing the new trade structure should yield good results. In view of these changes the recovery by the R.A.F. of its health and prospects so soon after its post-war disorganisation was striking. A large part of its work now consists in training. This is always to be expected in a Service which must constantly feed its Reserve and take in new men to replace those transferred to the Reserve, but the task is bigger at present than it would be in normal circumstances. Because the Service is relatively short of "old hands" it also suffers to some extent from lack of experience. Time is needed to put that right; just as time is needed to work out techniques for the operation of new aircraft, particularly new bombers, and to prescribe training schemes. Perhaps the greatest advantage of the R.A.F. lies in the fact that it is on the edge of a new phase of development. Air warfare is about to move forward. New equipment and new weapons are in sight. Those who are serving now as Regulars will take part in the next series of advances and have their share in putting air warfare on a new footing.

A whole new field is presenting itself not only to the aircrews but to the aircraft and engine tradesmen, to the armourers, the instrument craftsmen, the radar operators, and especially the radar technicians. Security, for the moment, sets a screen around a host of things that will almost certainly be in service before five years have passed. Not half the picture of what lies before him can be shown to the recruit of to-day. Only the more intelligent guess what research is yielding and foresee the consequences in accelerated development of these years of insecurity. The best publicity for the R.A.F. will be the gradual withdrawal of the screen and the revelation of the new marvels which the Service will be required to make work. The next decade in the R.A.F. is likely to be as fascinating an experience as that which followed the application of radar and jet propulsion to the processes of air defence. When that is understood by the current generation of young men there should be no lack of recruits even if inflation should have made rates of pay look less attractive than they were early in 1951.

E. COLSTON SHEPHERD

CHAPTER XXX

AIRCRAFT DEVELOPMENT

RECORDS AND OUTSTANDING PERFORMANCES

THE OFFICIAL speed and altitude records remain much the same as they were, three of them having been made in 1948; speed at low level, over 3 km. is held by North American F-86, with 670 m.p.h.; over 100 km. a D.H. 108 has made 604 m.p.h.; and a record made since the last issue of this volume went to press is that for speed over 1,000 km. by a Gloster Meteor 8, at 511 miles per hour.

For helicopters, all the records are held by Sikorsky; distance in a straight line is 703 miles, altitude is 21,215 feet, and speed 129 m.p.h.

The Atom-Bomber, Boeing B-56, is a 60-ton swept-wing aircraft which has flown 2,000 miles at an average speed of 607 miles per hour; ten American aircraft have exceeded the speed of sound; a Gloster Meteor with Rolls "Avon" engines has climbed 40,000 feet in about 4 minutes, and doubtless the same aircraft with Armstrong Siddeley "Sapphire" could improve on this. A visit to this country has been made by Convair military transports, each capable of carrying 400 fully armed troops or about 50 tons of vehicles.

Probably in view of the fact that the English Electric Canberra is to be made by Glenn Martin in the United States of America, one of these aircraft has flown the Atlantic against strong head winds, a distance of 2,000 miles, at 440 m.p.h., air speed being about 530 m.p.h.

The year has been notable for a number of delta-wing aircraft; several have flown, including Convair XF-92A, which has a 60-degree sweep-back, and an engine of 5,400 lb. thrust; XF4D-1, made by Douglas in the United States of America, is about to fly, if it has not already flown; and in this country there are the Avro 707A, 707B, and the Boulton and Paul P-111. With wings of this shape there is no tailplane; elevons take its place, acting as ailerons in addition.

While this is doubtless the best shape for supersonic flight, it has previously been explained that it is unlikely to be used for fighters; controllability at altitude depends upon reasonably low span-loading, the weight per foot of total span. With delta wings, span loading is a maximum; and quite apart from this, there is a certain amount of instability at normal landing speeds.

The likely method of landing aircraft of this type is to come in fast and release a tail parachute; this is the method adopted for the Atom-Bomber, Boeing B-56.

The most recent of the delta aircraft is the Fairey F.D.1, which flew on March 12, 1951; it measures only 19 feet 6 inches in span, and has not only a central drogue parachute in the rear but small parachutes on the wing tips. The undercarriage is of the tricycle type; and like other delta-wing aircraft, the fin and rudder are large, to check possible instability in roll.

In recent months the original supersonic aircraft, the famous Bell X.1,

has been sent to a museum, and test flying with this research aircraft will doubtless be continued on the other two. X.1 is a rocket-propelled aircraft, which has flown at about 1,200 miles per hour. Over two years ago it was taken off by a pilot under its own power, and climbed to 23,000 feet in 1 minute 40 seconds. It is stated that its best rate of climb is 28,000 feet a minute and that it is capable of 1,400 m.p.h. It is propelled by four Reaction Motors Rocket units with a total static thrust of 6,000 lb.; the rockets burn, if used all at once, for only 2½ minutes.

DEVELOPMENT AND PRODUCTION

One of the features of the year has been the extent to which well-known aircraft have become ubiquitous in more than one way: in the number of variants of any particular type, and in the number of countries in which an aircraft may be manufactured.

Gloster Meteor and de Havilland Vampire are both available in a number of variants for specialised roles: fighter, night fighter, carrier use, ground attack, or two-seater trainer.

Even Canberra, which began as a night bomber, is now made suitable for a tactical role; and during the year orders have been placed with four great firms, all of whom have in the past been responsible for four-engine bombers: English Electric; Avro; Handley Page; and Short Brothers & Harland. In addition, this aircraft will be made in the United States of America, by Glenn Martin; and in Australia by the Government factory at Fisherman's Bend.

* "One of the most striking examples of an aircraft designed abroad is the C.F.100 all-weather two-seat fighter, built by A. V. Roe, Canada, Limited, powered at present by two Rolls "Avons," but soon to be equipped with two equally powerful Canadian gas-turbines, Avro "Orenda"; the same company make a four-jet airliner. Other Canadian companies are Canadian Car and Foundry, who make a transport suitable for wheels or floats; Canadair, who make four-engine airliners; and there are also Cancargo's transport, de Havilland's light transport and Chipmunk trainer, Found Brothers' cabin monoplane, and the tailless glider built by the National Research Council. During the war Canada built 16,000 aircraft, more per head of population than any other of the Free Nations.

There are de Havilland companies in Australia and New Zealand; Government factories have built Lancasters, and are now building Lincolns engined with Australian "Merlins"; while the English Electric Canberra with Australian-built Rolls "Tay" or "Avon" engines will follow. Commonwealth Aircraft Corporation is building "Nene," "Tay," and "Merlin," with several types of aircraft; the de Havilland subsidiary is building the ubiquitous Vampire; Fairey-Clyde is repairing and overhauling at present, but can undertake manufacture.

Rolls "Nene" and "Derwent" are almost as ubiquitous as Vampire; fifty-five of them, alas, even went to Russia. However, it is rather a compliment to Rolls engineering to have their fine engines made under licence by one of the greatest of American companies, Pratt & Whitney, whose Turbo-Wasp models JT-6 and JT-7 correspond to Rolls "Nene" and "Tay." In Europe, the Hispano-Suiza version of the "Nene" powers almost every fast fighter.

The de Havilland Vampires are being built in Europe by France, Italy, Sweden, and Switzerland; Sweden also builds the "Goblin" engine. In addition, to countries already mentioned, Vampire is used by Egypt, India, South Africa, and Venezuela.

* *Journal of the Royal United Service Institution*, Feb. 1951, pp. 111 and 112.

An unexpected development during the year has been a report from America on the progress of atomic power for aircraft. The following is quoted from *Flight* of March 9, 1951.

Project N.E.P.A. (Nuclear Energy for Propulsion of Aircraft) is the name given to a research effort jointly conducted by the Atomic Energy Commission and the United States Air Force. Ambiguously reported in many quarters, the announcement made after four years of work apparently indicates that important progress has been made and a stage reached where theories and deductions can begin to be transformed into design studies with a view to subsequent building of an atomic power plant for aircraft. No time is quoted other than a vague "several years." General Vandenberg has, however, stated publicly that atomic flight is closer than most people realise.

Ten firms have been concerned with the first phase of N.E.P.A.'s work, and of these the Fairchild Company of Hagerstown, Indiana, is the "prime contractor." The General Electric Company enter into the next phase with engine research and constructional work in view, while the Consolidated Vultee Aircraft Corporation has been named in connection with design-studies for the aircraft to use atomic power units.

As regards atomic weapons, a rough figure has appeared in American newspapers as to the estimated size of the stock pile; this is variously described as a number such as 750 to 1,000 or alternatively "enough to drop ten atomic bombs on every major industrial city belonging to an aggressor power." The atomic bomb has been stated to be 22 feet long, and to weigh 5 tons.

MEANS OF PROPULSION

As regards British gas turbines, perhaps the most interesting development since the last issue of this volume is the appearance of the Armstrong-Siddeley "Sapphire," built to the original design of the engine with the same name by Metropolitan Vickers.

At the S.B.A.C. Display in September 1950 a Gloster Meteor research aircraft was flown with two of these large engines. The thrust is at least 7,200 lb. each; and at 650 m.p.h. this would give a total horse-power for this experimental fighter of 24,400. During the year also a similar Meteor equipped with two Rolls "Avons" climbed to 40,000 feet in approximately four minutes, the engine thrust being stated at 6,500 lb. each. It would appear that the new "Sapphire" Meteor could improve on this astonishing rate of climb. "Sapphire" is made in the United States of America by Wright.

The other big turbine, designed and made in Canada, is the Avro-Canada "Orenda"; it is at present believed to have a thrust of about 6,500 lb.

Allison of United States of America have released the information that they now have available a new and very large gas turbine for use in jet aircraft; but in publications as late as April of 1951 no weight is stated for this new engine, J35-A-23 of 9,800 lb. thrust.

The largest gas turbine in the world, as far as is known, is that made by Turbodyne, stated to develop at least 10,000 shaft-horsepower. Doubtless the airscrew for this enormous engine presented certain technical difficulties; but a photograph shows that it is made by the Propeller Division of Curtiss-Wright. It will absorb up to 20,000 horsepower, and has eight blades and a diameter of about 18 feet. The weight of the

complete propeller is just over one ton, and its maximum revolutions are stated to be 1,000 r.p.m.

The fourth Louis Bleriot Lecture was delivered before the Royal Aeronautical Society in London on February 23, 1951, by M. Maurice Roy, Director of the Office National d'Études et des Recherches Aéronautiques.

The title of the lecture was "Power versus Weight"; and in the closing stages the lecturer referred to the possible aid to propulsion which would be provided by a turbo-jet assisted by a ram-jet. This simple engine, rather like a tube, has been applied in the United States of America to the propulsion of guided missiles; and one or two small helicopters have ram-jets on the ends of the rotors.

Aero Digest in its issue for March 1951 shows, however, that the Marquardt Aircraft Company has produced three large ram-jet engines: a 20-inch diameter unit developing 2,500 h.p.; a 30-inch unit producing 10,000 h.p., and a huge 48-inch model developing 15,000 h.p.

Information in regard to these large engines has not previously been released; and it will be interesting to see what applications are proposed.

HIGH SPEED FLYING

From two widely different sources there have been reports as to the piloting problems involved in flying high-speed aircraft. One was the paper of that title read on November 30, 1950, by Squadron Leader John Derry before the Royal Aeronautical Society's Graduate Section.

Experience has shown that compressibility produced the following general symptoms: variations of hinge movement; flow breakaway causing buffet; changes in stability; tab and control ineffectiveness; and large unpredictable trim-changes. The last two effects were the most serious, and had given rise to confusing popular ideas about the "barrier." The most troublesome trim-change was nose-down—for manual or powered controls; in both cases the final result could be a very steep dive, either because of the trimmer's inability to relieve stick-force sufficiently or of complete ineffectiveness of control. Thus, a serious nose-down trim-change could result in genuine loss of control, although its onset was rarely too quick for some form of corrective action.

Nose-up trim-changes, more irritating than dangerous, produced, at the worst (at high altitudes), a "g-stall." This was not likely to prove catastrophic and, in practice, was rarely experienced unintentionally at high Mach numbers. Swept-wing aircraft, exhibiting the now well-known tip-stall, entered this condition more suddenly; and for aircraft with spinning tendencies, the "g-stall" brought the risk of spinning. Fortunately, the "g-stall" was usually straighter than was the normal stall. Reduction of g gave immediate recovery.

Only one form of vice was likely to cause structural failure—extremely violent flutter. Failures at high speed from other causes were, almost without exception, due to design failure or overstressing by the pilot—and not of any mysterious phenomenon hovering like a spectre at the "barrier." A very large proportion of the risk and discomfort could be avoided by patient and painstaking building-up in the Mach/I.A.S.* combination after thorough investigation of the Mach scale at maximum altitude.

The second article appears in *Aero Digest* of January 1951, on page 62, and refers to the entry into Korean fighting of the world-record holder

* Indicated Air Speed.

North American F-86. The group arrived in Korea on December 15; the next day Colonel Hinton brought down the first Mig-15 fighter:

Whether a piston-engine fighter did 400 m.p.h. or 425 m.p.h. was of consequence in World War II battles but whether a jet fighter does 700 m.p.h. or 725 m.p.h. in Korea or World War III is of far lesser consequence.

The maximum speed of the transonic fighter depends more on the pilot's courage and physical wellbeing than on the thrust-drag relationship of the aeroplane. In the case of the F-86A and the Mig-15, if we assume that both are roughly comparable in the degree of sweep (the Russian fighter has a substantially higher angle) and in their thrust-drag relationships, it follows that the faster aeroplane is simply the one the pilot pushes the harder.

As the Russian or U.S. pilot moves his aeroplane past 0.95 a strong nose-down pitching movement occurs requiring strong rearward movement of the stick to maintain level flight. As Mach number 1.0 is passed this stick force undergoes a sudden reversal and requires a strong push to maintain level flight. After stabilizing at about 1.15 the stick and pedals reveal an utter loss of effectiveness, erratic hinge moments and fluctuations from very strong to zero load.

The unnamed writer of this article goes on to say that there will be a tendency for an intelligent American pilot to limit the performance of his aircraft in the interests of safety; and the possibility is that a fleeing Russian or Chinese pilot might press his jet fighter to the point at which it disintegrates, like some Fokkers in the spring of 1916.

RUSSIAN AIRCRAFT

Up till the date of going to press of this volume in 1950 not much was known about Russian first-line fighters, though a reported fighter was stated to be engined with a British-built Rolls Royce "Nene". Late in 1950 a number of these aircraft appeared in Korea, and have been identified as the Mig-15; another swept-wing fighter has also been seen, the LA-17.

During 1950 a can of Russian news-reel films was captured, and provides illustrations of both these aircraft. As regards Mig-15, it is stated that the armament may consist of one 30-mm. and one 20-mm. cannon, though a four 20-mm. cannon aircraft has also been reported to be in Korea.

The same films showed a four-engine bomber styled TU-4, apparently identical with Boeing B-29. There are rumours of a four-jet bomber, of which a single sample was seen in 1947, but none since.

British sources say that the two Russian fighters are superior in speed to any R.A.F. fighter; the North American Sabre is apparently the only aircraft which can run them down; and it has been noted that they make use of rocket assistance or after-burning in order to get away, more probably the former. Some American medium bombers have been shot down by the new Russian fighters; they do not apparently remain in the field to try conclusions with Sabre.

ALL-JET MILITARY AIRCRAFT

The most striking development of the last twelve months has been a merging of the types of aircraft shown previously in Tables I and II. These tables are still headed respectively "650 M.P.H. Jet Aircraft" and "Night or 'All-Weather' Fighters."

But nowadays what began as a high-speed single-seat fighter has been

applied to a number of other duties, with modifications accordingly. One of the most striking examples is Gloster Meteor; its second variation was Mark III, known as the Sea Meteor; P.R. Mark V was for photo reconnaissance work; Mark VII was a two-seat trainer; Mark VIII as a fighter included engines made by Armstrong Siddeley, "Sapphire"; Mark IX was a reconnaissance fighter fitted with cameras and special windows; while Mark X was a similar aircraft for very high altitude, and unarmed. Meteor N.F.-11 is a night fighter, with a long nose to take radar equipment; and the Gloster Reaper is a tactical ground attack fighter.

The details of this last machine might well be quoted:

Meteor 8 airframe, strengthened where necessary to accommodate additional armament, R.A.T.O.G. units, etc. Fitted with wing-tip tanks, maximum armament loads of either four 1,000-lb. bombs, or twenty-four 95-lb. rockets in addition to standard complement of four 20-mm. cannon. For ferrying or long-range duties 580 gallons of additional fuel may be carried in the underwing and ventral tanks. Provision made for arrester hook and additional 20-mm. or 30-mm. cannon.

De Havilland Venom and Vampire are similarly ubiquitous, and it is beginning to be difficult to say where Vampire ends and Venom begins. Earlier Marks of Vampire were all of fighter type; but Vampire Mark V is a ground attack fighter, provided with long stroke (Naval pattern) landing gear, and strengthened wings to carry an external war load.

That load may include eight rockets and two 500-lb. bombs or an equivalent load of fuel in drop tanks; or, without the rockets, two 1,000-lb. bombs. This aircraft will be built also in France with the British-made de Havilland "Goblin" engine. Mark VI is an export fighter; Mark 30 is the Australian-built Vampire; Mark 50 is the Swedish-built Vampire; and in addition to all those there is a Vampire night fighter and a Vampire all-purpose trainer. That is, four main Vampire variants are already in production—ground attack, interceptor, night fighter, carrier-borne type, and jet trainer. The trainer has wings interchangeable with those of the standard Vampire Mark V fighter-bomber, so that armament training can follow exactly the requirements of operational flying in the single-seat Vampire. Provision is made to fit a camera gun in the nose and a standardised 10-channel VHF set. Provision could be made for a full radar installation.

Venom exists as a high-speed fighter, while Venom Mark 2 is a night fighter; the cockpit of the latter is modelled on that of the well-proved Mosquito, and the crew sit practically side by side, the radar operator slightly aft of the pilot.

The Venom fuselage is basically the Vampire fuselage in that it takes the "Ghost" engine without increase in diameter, and consequently the two-seat night fighter nose, newly designed for the Vampire, could easily be fitted to the Venom.

For any air force which is at present operating Vampire day fighters, a night fighter variant is offered, and with it the Venom, a day fighter of outstandingly high performance, its design readily adaptable for night fighting duties, becomes expeditiously available without the necessity for any basic conversion so far as piloting, maintenance, and administration are concerned.

This amalgamation brings to the top of the list Avro Canada CF. 100, which a year ago flew from Washington to Toronto and back at an average

speed of 570 m.p.h. It is at present equipped with the Rolls Royce "Avon" engines, but the Avro "Orenda" turbine has already been flown using an Avro Lancaster as a test bench; and when this large turbine is installed in CF. 100 it will become by far the second most powerful single-seater or two-seater in the world—the first being the "Sapphire" Meteor.

The Grumman Panther has been active in Korea, working from carriers. The original version was made as far back as 1946, and flew with two imported Rolls Royce "Nene" engines; the only difference between the various Marks is in the engines, and all the variants are single-seat carrier-based jet fighters. Although the Panther is a high-speed aircraft, it has no sweep-back. It is stated that large orders have been placed for Panther, but no figures have been disclosed. In the meantime Grumman are producing (probably in prototype form) their XF. 10F-1, also a carrier fighter, but this time with swept-back wings. This is powered by Westinghouse J-40, rated as "about 7,500 lb. thrust", and if this is the true power, the engine is a little more powerful than the British "Sapphire". The Westinghouse J.40 is provided with an after burner, giving 10,800 lb. thrust.

In Korea the Panthers used are flown from carriers by the Navy pilots. Marines fly their Panther variants from land bases in Japan. The Panther is officially credited with shooting down one Mig-15 Russian built fighter, with two probables and several known damaged Migs, in early 1951.

Although actual speed tests have not been disclosed, figures have been given for what are styled routine flights: 331 miles in 35 minutes, approximately 600 miles an hour; and two Panthers have averaged 630 miles per hour in a flight lasting 1 hour and 40 minutes. Panther has also been used as a ground support aeroplane, firing 5-inch rockets, 20-mm. shells, and 500-lb. bombs into the invading forces' beach landings. This marked the first use of a Navy jet fighter as a low-level support aeroplane.

The United States firm of McDonnell have a large order for Navy twin jet fighters styled Banshee; the aircraft bears a resemblance to Meteor, but has only half the power. It has, however, very clean lines; and, like Vampire, has been produced as a day fighter, a night fighter, and a photo-reconnaissance aircraft. It is stated to be in U.S.A. the first Service-type fighter with an initial rate of climb of 9,000 feet per minute, and has reached 52,000 feet (a new high-altitude record for jet aircraft in the United States of America), the time not being stated.

As regards Voodoo, made by the same firm, no further details of this very fast penetration fighter have been disclosed. The latest release, now a year old, still says that the aircraft is in the 700 miles per hour class.

A year ago not very much was known about the Northrop F-89 Scorpion; and little has been released. Speed is stated as "more than 600 m.p.h.," and armament as six 20-mm. cannon. The weight is 30,000 lb.

The North American F-86 Sabre still holds the world's record over the measured mile, 670.981 miles per hour, made in September 1948. A number of improvements have been made since then, and it seems possible that with very little effort the record could be broken. Similar aircraft to the record breaker have been in constant use in Korea, and have had many successes against the Communist jet fighters. It is said to be the only

Allied fighter that can catch the Mig-15 in level flight, whatever may be the merits of high-altitude interceptors of other makes. Reports show that Mig-15 almost invariably resorts to the use of rockets or after-burning in order to get away.

As with the de Havilland aircraft, there are a number of Sabre variants, though complete details of all of them have not been disclosed. There are two revised versions of the standard fighter: F-86D is an all-weather jet interceptor, and F-86E has a specially designed system of controls. The production changes for both are slight, so that either of the new types can be brought into production in large quantities with very little delay.

In addition to a variant styled F-93A which uses the Pratt & Whitney J-48 (based on Rolls Royce "Tay"), there is a Naval variation of the Sabre styled F2J, which has folding wings and provision for catapulting and landing-on.

No further information has been made available about the Republic experimental interceptor, which incorporates swept-back wings of variable incidence and inverse taper; but the heavily armed Thunderjet has been in use in Korea since December 1950. The armament includes six 12.7 mm. machine guns as before; and various different combinations of offensive weapons are available: thirty-two 5-inch HVARs or two 11.5-inch and sixteen 5-inch HVARs. Napalm bombs. Two 1,000-lb. bombs and eighteen 5-inch HVARs.

HVAR is the high velocity aircraft rocket; Napalm bombs are filled with 110 gallons of jellied petrol, which covers with flame a strip of ground 270 feet long by 80 feet wide.

No further details have become available for the high-speed French fighters, and no performance or weights for either of these have been stated at the time of writing. These are the Dassault interceptor styled Ouragan or "Hurricane" and the Nord 2,250, a shipboard interceptor. Both are powdered by the Hispano "Nene".

The all-weather fighters remain as before, with no fresh information; but to the list of all-weather two-seaters there could be added the de Havilland and Gloster variants of Vampire and Meteor.

BOMBERS

Table III has not greatly altered during the last twelve months; a certain amount of spectacular development has taken place in the very large American bombers. One interesting feature of the year was the visit of six Convair B-36 aircraft in January 1951 and three Douglas C-124-A Skymasters, so enormous as to dwarf any aircraft previously flown in this country, with the single exception of Brabazon: B-36 is as large as Brabazon and far heavier.

The makers state that these great aircraft can each carry a 5-ton bomb 5,000 miles, drop it, and return home a further 5,000 miles without refueling; at reduced range, a maximum bomb load of 42 tons can be carried.

The new models of this great aircraft represent considerable advance in development. They are equipped with four J-47 jet engines in addition to six 3,500 h.p. pusher-type reciprocating engines. Mounted in pairs in a "pod" beneath the outer wing panels of each B-36, the four jet units

provide additional power for take-off, improve the rate of climb, raise the service ceiling, and increase the plane's speed. Maximum speed of these D models is over 435 m.p.h., and their service ceiling is over 45,000 feet. Maximum gross weight is approximately 358,000 lb. Wing-span of the B-36 is 230 feet. Length of the plane is 162 feet; height nearly 47 feet.

Externally, the RB-36 reconnaissance aeroplane closely resembles the B-36 bomber; but internally, instead of bombs the RB-36 carries the large cameras and other special equipment needed in long-range high-altitude reconnaissance. In the RB-36 forward bomb bay, for example, are fourteen different cameras, including one with a 42-inch focal length lens. This is believed to be the largest photographic set-up ever designed into one aeroplane.

The B-36 bomber and the RB-36 reconnaissance aeroplane have the same defensive armament. They are protected by eight remotely controlled turrets containing a total of sixteen 20-mm. cannon—more firepower than any other known bomber. All turrets, except those in the nose and tail, are retractable.

All B-36s have four-wheel main landing gears and a steerable dual-wheel nose gear. These eight 56-inch main wheels distribute the B-36's weight over a comparatively large area of the runway, enabling the plane to operate from almost any airfield that can accommodate medium-size bombers.

This new global bomber, in spite of its size, is controlled with ease through the physical effort of the pilot. The huge control surfaces are operated, without any power boost, by spring tabs attached to the trailing edge of the control surfaces. The pilot operates only these tabs, which in turn move the control surfaces by aerodynamic forces.

Utility and flexibility of the B-36 have recently been increased by development of bomb bay fuel tanks, cargo carriers which fit inside the bomb bay, and an engine nacelle carrier which is suspended externally from the bomb bay. Bomb bay fuel tanks enable the B-36 bomber to extend its normal range if certain missions should require it. The all-metal cargo carriers enable the B-36 to operate as a transport, with a capacity of 80,000 pounds of cargo. The nacelle carrier enables the B-36 to deliver four of its own spare power plants to bases where they may be needed.

An experimental transport version of the B-36, designated XC-99, was recently delivered to the United States Air Force. It will carry 400 troops or 100,000 lb. of cargo.

B-36 as a photographic aircraft is something much in advance of anything previously described; in the United Aircraft Company's house magazine, *The Beehive*, there is a description of the method in which photographers of the future would carry out a photographic reconnaissance of the mythical city of "Fortworthograd":

Depending on the mission, the cameras might begin photographing as they came within twenty-five miles of the city and continue until the reconnaissance bomber was twenty-five miles past the metropolis. On the film would be recorded details that would identify the city's industrial secrets as completely as a thumbprint identifies a man. From the shape of buildings, the colour of slag piles, the photo-interpreters back at the base can ferret out the nature of the products and the capacities of the factories.

Also, the cartographers will be provided with pictures from which they

can make maps and charts for all the armed services. And, if a bombing attack is in the book, the crews of the B-36's will have a complete set of photographs showing them how the ground should look as they approach the target, make their bombing run, bomb, and depart.

Even if the weather is so bad that clouds hide the entire countryside, the RB-36's still have a way of photographing their objectives. From the aeroplane the electronic eye of radar pierces the mists and traces a glowing map-like outline of the land on the RB-36's scope. A 35-mm. camera automatically records the changing shapes on the radar screen. Back at the base, the pictures are printed on a series of cards, with the locations identified and matched with maps for use of the bomber crews. Although specific objectives are often difficult to distinguish in a radar scope because the outlines are not clear-cut, the same area viewed from the same direction will be identical. The B-36 bombing crew has only to match its own radar readings with the pictures taken of the RB-36 radar to make sure of the target. The cameras make all-weather bombing almost a certainty.

During the year some further details of one or two other American bombers have been disclosed, each constituting fresh developments.

The Northrop YRB-49A is capable of photographing tremendous expanses of terrain in a single "shot" while cruising in the stratosphere at high speed. Numerous cameras and elaborate electronic equipment are housed within the aeroplane to enable it to accomplish its mission as a "hemispheric" scout. Six turbojet engines drive the new Flying Wing. Clean, drag-free lines of the Flying Wing and exceptional range of previous versions of the big tailless bombers led to the decision to equip the latest version as a photo-reconnaissance bomber. One of the most difficult of big aeroplane assignments, photo-reconnaissance missions require a combination of exceptional speed, altitude, range, and stability. Range of the new aeroplane remains undisclosed. Measuring 172 feet from wing tip to wing tip, the YRB-49A weighs more than 100 tons when fully loaded. Indicative of its aerodynamic efficiency is the fact that the Flying Wing is one of the few aeroplanes capable of lifting more than its empty weight in useful load.

An article in *Aero Digest* of November 1950 provided an interesting history of the development of Boeing XB-47, the Atom Bomber. It showed in some detail the manner in which the United States Air Force provided a series of large jet bombers by placing orders with four great firms:

The Air Force issued design study and mockup contracts to all four of the entrants and divided up their configurations into pairs, so that each contestant would have only one rival. Thus, the North American XB-45 was paralleled closely by the Convair XB-48, both using four J-35 turbojet engines mounted in pairs in wing nacelles. The Glenn L. Martin XB-48 and the Boeing XB-47 were both assigned the task of mounting six turbojet J-35 engines in nacelles. Ultimately, Northrop Aircraft was awarded a contract for the installation of eight J-35 turbojet engines in its famed Flying Wing design. These study contracts were formalised in March 1945, by experimental orders calling for the construction of three prototype aircraft, plus a static test model.

The B-47B model, for which the contract for eighty-two was awarded, features a substantial addition in fuel capacity from two huge drop tanks suspended under the wings. This added weight further upped the gross weight of the aeroplane and the powder-rocket RATO units will be replaced by longer-burning liquid-fuel RATO motors. The power plant installation is unchanged.

One B-47C aeroplane is being built powered by only four turbojet engines. These are the new Allison J35-A-23 engines delivering 9,700 lb. thrust each,

giving substantially more thrust with only four engines than that available from the earlier six-engined models. The Air Force has allocated \$4,122,427 for this conversion.

Despite the addition of wing area late in the design stage of the B-47, the Stratojet bomber has the highest wing loading of any aeroplane ever built—more than the Bell X-1 research aeroplane. It was for this reason that eighteen solid-fuel RATO bottles producing 1,000 lb. of thrust each were included in the detail design of the aeroplane. These units discharge through small louvres in the aft portion of the fuselage. The increase in allowable gross weight of the B-47B has necessitated the increase of this auxiliary power with recently developed liquid-fuel RATO units developing 20,000 lb. of thrust. Landing distance may be held down by a 30-foot drag chute stowed in the plane's tail. Released after touching down, the chute is held fully extended by the jets from the engines during taxi-ing and even when standing still, thereby preventing its being damaged on the ground.

Though it is not a jet aircraft as yet, reference should be made to Boeing B-50D Superfortress, not included in Table III, as the standard model has only reciprocating engines, with a total of 14,000 h.p. at take-off.

The Boeing B-50D Superfortress is the standard "medium" bomber in the Strategic Air Command of the United States Air Force to-day. It is the third aeroplane type in the B-50 series and is similar in appearance to the Boeing B-29 Superfortress, from which it was developed immediately following the end of World War II.

All aeroplanes in the B-50 series differ from the B-29 in having wings which are 16 per cent. stronger, 25 per cent. more efficient, and 650 lb. lighter than those of the B-29. B-50s also have 59 per cent. more horsepower, more quickly retractable landing gear, thermal anti-icing equipment, simplified maintenance provisions, steerable nose wheels, reverse pitch propellers, and a great many other improvements over the B-29s, which make them 75 per cent. new aeroplanes. The vertical tail is 5 feet higher than that of the B-29.

One of the first B-50As, the "Lucky Lady II," made the first non-stop round-the-world flight in history, February 26 to March 2, 1949. By means of four in-flight refuelling transfers en route, this bomber made the 23,452-mile flight from Fort Worth eastward to the Azores, Saudi Arabia, the Philippines, Hawaii, and back to Fort Worth in 94 hours 1 minute.

Some of the 400-m.p.h. B-50s are equipped with refuelling-receiver equipment of newer design than that used by the "Lucky Lady." This new Boeing-designed Flying Boom system offers faster refuelling at higher altitude and greater speed.

The B-50D differs from earlier models in having provisions for the installation of a droppable 700-gallon wing tank or a 4,000-lb. bomb beneath each wing.

A development of the North American Tornado is larger than that appearing in the table for last year; it has been specially built for high speed, high altitude, photo-reconnaissance, and bombing work.

Equipped with five camera stations, the aeroplane will serve as a "flying cartographer for the Air Force." Special duty scheduled for the RB-45C includes day and night reconnaissance at high and low altitude, charting, mapping, and photographing terrain, installations, and other important areas.

Powered by four General Electric J-47A jet engines, each with a static

thrust of 5,200 lb., the RB-45C has a total thrust of 20,800 lb., equivalent to over 30,000 h.p., placing the bomber in the 550 miles per hour class. Added power is available for take-off by the use of alcohol-water injection with the jet engines.

With a maximum gross take-off weight of 50 tons, the new aeroplane has a service ceiling of over 40,000 feet and a normal tactical radius of over 1,200 miles, with the use of wing-tip tanks. Range can also be increased by the use of bomb-bay tanks. Automatic fuel selectors aid the pilot by drawing from the aeroplane's tanks evenly, equalising the balance of the aeroplane as fuel is consumed.

The RB-45C has a crew of three—Pilot, co-pilot, and photo-navigator. The pilot and co-pilot sit in tandem in a pressurised cockpit, with dual flight controls to permit the co-pilot to act as relief or emergency pilot. The photo-navigator also acts as bombardier and radar operator.

Additional flying aids, such as electrically controlled trim tabs and a hydraulic boost system to assist in the operation of flight controls, reduce the amount of "pilot beef for stick forces." Catapult ejection seats for the pilots, and an escape hatch for the photo-navigator provide means for emergency abandonment of the aeroplane.

ANTI-SUBMARINE AIRCRAFT

In February 1951 the Ministry of Supply announced that they had placed an order on behalf of the Admiralty for a substantial number of Fairey 17 carrier-borne anti-submarine aircraft. These aircraft have many interesting technical features additional to their doubly folding wings mechanically operated.

By mounting the pilot above the engine, a truly exceptional forward view is obtained; and this important feature for deck landing and reconnaissance search operations is further enhanced by the fact that the pilot has a visual range down to an acute angle almost directly below the aircraft and to far astern.

The radome (colloquially "dustbin") housing the radar devices is mechanically lowered astern of the rear cockpit on operations, but for normal non-operational cruising flight is retracted into the fuselage. Attack weapons are stowed inside a large bomb-bay beneath the fuselage, and provision is made for sonobuoys and other war equipment on the wings.

The Fairey 17 has been developed for full deck operations on aircraft carriers, and has a tail-sting type arrester hook and equipment for catapult launching.

The Fairey 17 is powered by an Armstrong Siddeley "Double Mamba" which consists basically of two independently operating engines, harnessed to work either as a team or separately. In flight either one of these side-by-side turbines can be stopped, and the aircraft flown with full efficiency on the remaining unit, the stationary propeller being then fully feathered to minimise drag.

This ability to fly on any one half of the double engine brings with it many advantages:

- (1) The factor of double safety is introduced, since the aircraft is in effect a twin-engined aircraft having a single-engine installation, able to fly on either of the two engines.

- (2) Maintenance is reduced, since for most of its flying life only one half of the engine is in use; and this brings self-evident advantages concerning the overall wear and tear in the life of the engine.
- (3) Whilst sufficient power for cruising is available from one half of the engine, the full power of the double engine gives the aircraft an excellent take-off and a reserve of power for emergency use (for example, on going into attack or on a baulked approach to deck landing).

"Double Mamba" incorporates a "reverse torque mechanism" which is in effect an automatic feathering device. The pilot can switch from one half of the engine to the other in a matter of seconds.

Like the Gloster Meteor and the de Havilland Vampire, the Fairey Firefly has been made in a number of variants; day fighter, reconnaissance fighter with search radar, and night fighter; a trainer for the Royal Navy, for flying and instrument training; and another version for armament work; Firefly Mark 5 and Firefly AS Mark 6 were equipped for anti-submarine work, and there is also a target tug and a deck landing conversion trainer referred to elsewhere.

Other types of anti-submarine aircraft are the Blackburn YB1 three-seater, with an Armstrong "Double Mamba" turbo prop; and the Short Brothers & Harland SB3, in which it is possible to house, in addition to the pilot, one, two, or more radar operators and a comprehensive range of equipment. This arrangement would overcome fatigue due to a period of watching the radar screen, with the possibility that efficiency of scanning might decline. The Short Brothers & Harland SB3 has two "Mamba" turbo-props.

The American anti-submarine aircraft include the Chance Vought Corsair, of which there are many variants, including one night fighter. It is remarkable for comprehensive electronic equipment carried (like that of the Fairy Firefly) on the wing. Radio equipment includes VHF (very high frequency) radio communication, IFF (identification friend or foe), audio-range system, radio altimeter, and navigation antenna.

The American firm of Grumman Aircraft Engineering Corporation have produced anti-submarine aircraft which fly in pairs, one equipped as a hunter and the other as a killer. Each is styled "The Grumman Guardian" but with different Mark numbers.

Nearly a year ago Lockheed began delivery of their P2V Neptune, specially equipped to seek out the Schnorkel submarines; its most striking feature is its long range, and a similar aircraft still holds the world's long-distance record (without refuelling) of 11,236 miles.

Like many other anti-submarine aircraft, including the Fairey Firefly, Neptune is able to carry the device known as the sonobuoy. These buoys, carried internally, are dropped in the area where a submarine is located. Floating on the surface of the water, the buoy contains a microphone which can be lowered to the proper depth. The microphone picks up the noise of the submarine's propellers and relays this information by a small radio set in the sonobuoy to the searching aircraft. Radio receivers in the aeroplane pick up the buoy's signals and an accurate position for the submarine is determined.

OTHER NAVAL AIRCRAFT

On November 8, 1950, there was a lecture at the Royal United Service Institution by Vice-Admiral M. J. Mansergh, C.B., C.B.E., dealing with Naval Aviation. After dealing with search aircraft, the lecturer said :

The ideal would be to combine the A/S strike role with the search role in one aircraft, known by our American friends as a "single package" aircraft. This is, in fact, the aim, and the aircraft we are developing for this purpose is the G.R.17, of which there are three prototype versions in existence. Two of these—one made by Fairey and the other by Blackburn have double "Mamba" turbo-jet engines driving contra-rotating propellers; the third is by Blackburn and has a Rolls Royce Griffon engine. One advantage of the twin "Mamba" engine is that you can fly on one engine driving one propellor which increases endurance and also the confidence of the crew!"

In regard to fighters, the lecturer said that de Havilland Venom would be used as an all-weather day or night fighter; and for Fleet protection either Supermarine Attacker or Hawker Seahawk :

The Attacker is a single-seat single-jet interception fighter, and the only jet in production in England with a conventional tail-wheel under-carriage. It is pressurised for operation at very high altitude, is armed with four cannon and it can do over 500 knots at sea level. The Sea Hawk, which will replace the Attacker, has a tricycle undercarriage, and is capable of considerably higher speed. Both these aircraft have shown themselves to possess excellent fighting manœuvrability. Both, also, have been successfully deck landed.

Looking further ahead, we expect future fighters for the Navy to be single or twin jets, with swept back wings. They will be of both the single and two-seater varieties. They will also be fitted with reheat, which is a method of getting more thrust out of a jet engine (and thus higher performance) by injecting fuel into the jet pipe. We expect these aircraft to be more than adequate to deal with any aircraft which they may expect to meet.

There remains the last of the three main fighting roles—the strike role. This can be divided into anti-ship and anti-shore target strikes, but clearly it would be better if the same aircraft could undertake both duties. A strike aircraft must be capable of carrying a variety of offensive weapons, and must have high speed so that it has a good chance of avoiding enemy fighter and anti-aircraft gun opposition. Naturally, the longer the range of the strike aircraft the better, and it must be able to operate in all weathers, day and night, and thus radar is a requirement.

The Westland Wyvern, shortly to come into service, will fulfil most of the foregoing requirements. It is a single-seat aircraft with a turbo-jet engine driving contra-rotating airscrews. It has forward firing fixed guns and can carry a variety of weapons, including the formidable load of a torpedo and fourteen rockets.

MILITARY TRANSPORTS

During 1950 Major General Laurence S. Kuter, the Commander of the Military Air Transport Service, delivered a lecture on "The Transport Aeroplane as related to Future Military Plans" to the Society of Aeronautical Engineers in New York. He recalled that large-scale air transport in the past had usually been applied to meet an emergency, as distinct from fulfilling long date plans. Some of these emergencies included the air transport of 60,000 men monthly across the Atlantic, from war in Europe to war in the Pacific; entire Chinese armies were moved and fed; the occupation of the Japanese home islands was carried out by air; and even the air lift to Berlin was created to plug an unexpected gap.

By 1955 he hoped to have available for continuous military service the equivalent of about 900 Douglas C54 aircraft, the Skymaster, each able to carry a maximum load 15 tons including fuel; and to those might be added a proportion of all the four-engine civil domestic air line aircraft. But he added that at the end of the war United States air transport aircraft numbered more than 3,000.

In making long date plans for quantities of large military transports, the United States have put in hand very large production programmes with a number of their greatest firms; in this they are not alone, and the following description of modern large transports may be quoted from the *Journal of the Royal United Service Institution*:

Naval and Military transports are being built by at least a dozen of the greatest aviation firms in the world: Bristol, Blackburn, Vickers, Breguet and Nord, Boeing, Chase, Convair, Douglas, Fairchild, Lockheed, Northrop. In all of them freight comes first, vehicles, guns, bulldozers, tanks, military stores in packs or paracans; troops with full equipment, or walking wounded, sit on tip-up seats, but there are attachments for stretchers, numbering 300 in Convair C.99, their occupants delivered straight from Europe to home. To-morrow's transport, then, is suited for troops, paratroops, wounded, delivery of vehicles or other equipment, or supply dropping. The aircraft are equipped with electric hoists, overhead runways, roller conveyors, ramps at one or both ends, and electrically-operated hatches. Fairchild C.120 has a detachable pack which will hold nine tons of freight; or, as a medical unit, complete with thirty-six stretchers and three attendants. The Lockheed Constellation also has a Speedpak, fitting fuselage contour, raised and lowered by electric hoist, with a stowage of 8,200 pounds payload.

In Table IV, there is a list of large military transports; it now contains names which did not appear in this volume for 1950; and the newcomers are outstanding in the remarkable development of their technical efficiency for loading, carrying, and unloading very large quantities of assorted military equipment in a short time. For example, the big Douglas aircraft could be unloaded in forty-five minutes; the Standard Fairchild Packet in about fifteen; but Fairchild C.120 could have its detachable pack and 9 tons of freight released and wheeled away in less than five. Presumably, little more time would be required to wheel in and fasten up another loaded pod for the return journey.

One of the greatest advantages of this remarkable aircraft is that immediately an incoming load of military equipment has been detached an outgoing ambulance pod already fully loaded with sick or wounded could be wheeled in and attached, so that the aircraft need remain on the ground little more than fifteen minutes.

In an article in *Aero Digest* its far-sighted Managing Editor contributes several bright ideas which may or may not already have been considered by military planners. The following paragraphs are quoted from that article:

The pod can be designed exactly to each individual need at low cost. If it is to be used as a forward-area hospital or receiving station for the wounded, it need not have the highly-stressed floor demanded by the pod which carries heavy ordnance. The pod designed to transport the wounded from the front will need many special refinements in sidewall construction and towards sound-proofing and temperature control. The pack for heavy guns, tanks, and motor trucks requires little more than a sturdy floor and an appropriate supporting-and-bracing structure. The outer covering can be in the nature of an inexpensive, expendable shell.

A simple plywood pod probably would suffice where supplies and machines are transported. In the case of air transport of small and medium tanks, heavy artillery and bulldozers, they may well be flown into a forward area by suspending them from the bottom of the power fuselage and streamlining both the load and suspension fittings with some inexpensive commercial plastic.

Large heavy-lift helicopters could operate hand-in-hand with fixed-wing aircraft for pod-transport into undeveloped areas, ship-to-shore, from terminal seaboard airheads to ships off the coast, for rescue missions and a thousand other uses. The helicopter would pick up where the aeroplane leaves off, and vice versa.

It is said that the American Military Air Transport Service specified that the pannier or pod was to be suitable for carrying telephone poles; and whether that is so or not, the other Fairchild aircraft, C.119 Packet, carried a 600-ton steel bridge for use in Korea:

Each plane carried three 2,500-lb. sections per trip, and delivery of the bridge was accomplished in seventy-odd sorties. Later, the Packets flew another bridge, this one even larger, into Korea. The latter was a 600-ton steel bridge destined for a river crossing below Pyongyang. Each section weighed 4,000 lb.; each Packet carried three sections. Delivery was accomplished in about a hundred sorties.

The C.119s carried a number of other loads that even C.54s couldn't handle; large fork lifts, a complete asphalt paving unit, bulky 19,000-lb. wire rolls, a completely equipped fire crash truck, large transmitters, and some three-ton generators.

An article in *American Aviation* for June 1, 1950, suggested an enlarged version of the Packplane, with two gas turbines driving propellers; this would permit an increase in maximum gross weight to 77,000 lb.

In the same article reference is made to the Lockheed Pannier, mentioned in last year's volume. The following is a quotation:

The company points out that six pod-equipped L-168s could provision an entire infantry division with 53 tons of food, 104 tons of fuel, and 110 tons of ammunition daily. The big L-168 pod could double as a heavy equipment carrier, carrying, in one pod, such loads as eighteen jeeps, two 2½-ton trucks, or one heavy wrecker.

The pod-champions envision an aerial merchant marine consisting of large numbers of detachable-fuselage long-range aircraft and short-range pod-carrying helicopters like the Piasecki XH-16 now in development.

The long-range planes ferry the supplies across the ocean to a central receiving point, drop their fuselages, and return; the helicopter picks up the pod and flies it directly to the unit for which it is intended. Result: the elimination of the numerous in-between depots, an in-transit time measured in hours instead of months, and entire freedom from submarines.

The suggestion that large helicopters could be used to carry the panniers from an aerodrome to some other site is not at all impracticable. Later in this article reference is made to the Howard-Hughes helicopter powered by two 3,000 h.p. gas turbines. It has not yet flown but is capable of lifting 10 tons in addition to its own weight.

The other new military transport is that built by Chase Aircraft Company, formerly well known as the manufacturers of large gliders. But their products now are fitted with engines, and the aircraft itself is so much in advance of almost anything else in the world other than Fairchild that it constitutes a notable development in military aircraft.

The combination loading ramp and cargo door, hydraulically operated, is a significant feature of Chase Avitruc. The ramp section, which extends the full width of the cargo compartment, drops to the ground while the door folds up into the plane, giving full head room to the largest piece of equipment carried. Conveniently located side doors may be opened in flight for dropping supplies, while the cargo door may be opened for dropping larger bundles. The low floor line (30 inches above ground level) further simplifies the task of loading. Cargo tie-down rings of 10,000 lb. capacity are located on the floor of the cargo compartment on a standard 20-inch grid pattern, assuring positive tie-down of any cargo.

The floor of the cargo compartment is capable of supporting distributed loads of up to 500 lb. p.s.f. Two treadways accommodate vehicles with loads up to 4,000 lb. per wheel.

Heavy shipments or vehicles without power can be pulled aboard by means of a cargo-assist-device (which can be mounted to cargo tie-down fittings) either through rear or side doors.

The provision for loading at truck-bed-height completely eliminates the hustle of fork lift trucks. The propeller pitch can be reversed, the plane backed into a loading area, the ramp lowered to a waiting motor truck, and cargo transfer made in a matter of minutes. Cumbersome shipments need not be disassembled for loading, and consequently may in time of emergency be put into service hours earlier.

The YC-122C is capable of being towed by other aircraft from prepared fields, or by snatch pick-up from unprepared fields. Easily removable nacelles make it possible for it to be towed either with or without engines. Also, it may be used as a glider tug, since tow release assemblies are built into both the nose and rear of the fuselage.

Among the safety features offering protection to flight personnel are a welded steel tube fuselage construction for crash protection, sturdy bulkhead between cockpit and cargo compartment as protection against load shifts, jettisonable self-sealing nacelle fuel tanks, and complete fire control instrumentation. Provision is made for the installation of droppable wing-tip-tanks for longer range operation.

It must not be thought that Great Britain has entirely neglected the "pantehnicon" technique; and a kind of detachable pannier can be dropped by parachute from Handley Page Hastings. It will accommodate bulldozers, 25-pounder anti-tank guns, or 3-ton tanks; it has many other applications, including supply dropping, when a typical load would be twenty-two 350-lb. panniers and twenty 400-lb. containers.

The United States Military Air Transport Service, and logistics experts, see in the detachable pack aircraft a highly promising line of development. They believe that the pack technique applied to the right kind of airframe layout is the logical aeronautical extension of the highway trailer and its truck tractor and the split-cargo load compartment in the railway freight business. To summarise, they see in the pack-plane principle the following possibilities: (1) reducing the number of aircraft required by the operator; (2) increasing the aircraft utilisation two- or three-fold; (3) reducing the ground handling time and cost to the minimum; (4) providing flexibility of operation; and (5) providing storage and transportation space for various types of cargo and supplies.

Mention must be made of the British Blackburn Universal transport for the Ministry of Supply; it was seen flying at Farnborough in September of 1950 and can be applied to supply dropping, or the transport of troops with equipment, paratroops, ambulance duties with stretchers, and can also accommodate supply containers externally. Its maximum load, for short range is 14 tons; and it will carry 7 tons very nearly 2,000 miles.

THE LARGER BRITISH CIVIL AIRLINERS

The Airspeed A.S.57 Ambassador is a twin-engined high-wing mono-plane intended for medium-distance use between cities. It has a low span-loading and is probably the first twin-engined aircraft to be taken off entirely on one engine, demonstrated at the 1948 S.B.A.C. Display. A military version has been designed, with a special loading ramp; and plans exist for another design, A.S.67, for use as a commercial freighter. Layout of these aircraft will permit either two or four turbo-props.

The Armstrong Whitworth Apollo has four "Mamba" turbo-props; normal seating is for twenty-six passengers in pairs on each side of a central gangway, but arrangements can be made to take forty-nine passengers. The estimated maximum speed is 345 m.p.h. at 20,000 feet, and at the same height normal cruising speed is 276 m.p.h. The range in still air is 1,440 miles.

Two Bristol Brabazons, type 167, have been ordered; and one has been flying for some time. Both are intended solely for research. The first has piston engines, and the second, due to be completed about May 1952, is intended to have Bristol "Proteus" turbo-props. The Mark 2 will be furnished, if present plans continue, to carry 100 passengers by day or night, with a flight crew of seven and eight stewards. The span is 230 feet and the maximum take-off weight 290,000 lb.

De Havilland Comet is a high-speed jet airliner powered by four Ghosts and intended for inter-continental service. It has a cruising speed of 490 m.p.h. and the thirty-six seat version will carry a payload of 12,000 lb. over a stage distance of 2,140 miles. The landing gear units are four-wheel bogies. The span is 115 feet, and the all-up weight 105,000 lb.

The Handley Page Hermes 4, H.P.81, is the civil version of Hastings. It has four Bristol Hercules engines each rated at 2,020 h.p. for take-off. Normal accommodation is for forty passengers, but a maximum of seventy-four can be carried. The span is 113 feet, the maximum take-off weight 82,000 lb., and the maximum speed 357 m.p.h. at 20,000 feet.

The Vickers Viscount has four Rolls Royce "Dart" turbo-props. Normal seating provides for forty passengers, but fifty-three can be carried. The span is 89 feet, and the maximum all-up weight 40,000 lb. There is an experimental development of the Vickers Viking with two Rolls Royce "Nene" gas turbines; normal accommodation is for twenty-four passengers; the span is 89 feet, the maximum take-off weight 33,500 lb., and the maximum speed 468 m.p.h. at 10,000 feet.

The Canadian-built and designed Avro Jetliner is the first passenger airliner in North America to make use of jet power. The Jetliner is the world's first all-jet transport built for inter-city travel. The prototype has been successfully test-flown, establishing new speed record for its type of over 500 m.p.h. in level flight at 30,000 feet. It is expected to be

flying passengers on commercial routes in 1952. Cruising speed is 450 m.p.h. at 30,000 feet. There is comfortable accommodation for forty to sixty passengers. Pressurisation, ventilation, heating, and cooling can be automatically controlled or preselected.

Four Rolls Royce Derwent engines are mounted in pairs in the two underslung nacelles, which also house the main landing-wheels. The normal operation range of the Jetliner is between 200 and 1,200 miles. During the course of tests the Jetliner has been flown at more than 500 m.p.h. in level flight, establishing a new North American speed record for its type. Experience has shown that it can be flown very easily at 140 to 150 m.p.h. in a circuit, and as a result of the light, responsive, and well-harmonised controls 360-degree turns can easily be made inside the perimeter of modern airports.

LARGE AMERICAN CIVIL AIRLINERS

The Boeing Model 377 Stratocruiser is in use with four American air lines, as well as with B.O.A.C. The American air liners have seats for about sixty day passengers; the B.O.A.C. model has luxury accommodation with seats for fifty-five on main deck; or twenty seats available when seventeen berths are made up to sleep twenty-six. There are four Pratt and Whitney engines with take-off output of 3,500 h.p. with water-injection. Normal take off weight is 142,500 lb. and maximum speed 375 m.p.h.

Convair have produced a new and enlarged version of their 240-A. The new aircraft is styled Convair 340, and is, in fact, almost a new aircraft, having greater wing area, a longer fuselage, increased all-up weight, more powerful engines, higher fuel capacity, and many interior-design improvements. Gross weight is about 45,000 lb.; the engines are two 2,400 h.p. Pratt and Whitney, and maximum speed is said to be about 355 m.p.h.

A variant of this liner is the Convair "Turboliner, America's first turbo-prop transport, which first flew on the last day of 1950. It is a research transport purchased by Allison to test their turboprop engines in a modern commercial-type plane. Two 2,750-h.p. Allison 501 turboprop engines are installed.

Douglas DC-6 is a successor of the well-tried DC-4. It can accommodate forty-eight passengers in day seats and a varying number of berths instead for twenty-six to thirty-nine. The weight loaded is 97,200 lb., and the maximum speed 356 m.p.h.

Lockhead Constellation in its civil version has seating accommodation in varying arrangements for forty-four to sixty-four passengers, with some sleeper versions; for Eastern use ninety-two passengers can be carried. Four Wright engines are each rated at 2,500 h.p. for take-off. The maximum take-off loaded weight varies between 94,000 and 105,000 lb.

FLYING-BOATS

In February 1951 there was a lecture at the Royal United Service Institution by Air Vice-Marshal Mackworth entitled "Flying-boats in War" which outlined as far as this country is concerned the main requirements of an anti-submarine flying-boat; he deduced these requirements

from experiences in World War II ; and from the results of very much more recent experience with flying-boats in operations in Korea and Malaya. The advantages of the flying-boat for anti-submarine work were stated ; great flexibility, requiring no airport construction, and the ability to move to the other side of the world within a day or two.

Requirements were laid down, especially for a flying-boat to be applied to anti-submarine work, in the light of this experience. He thought that the optimum all-up weight would be between 75,000 and 80,000 lb. A maximum patrol speed of 180 knots was quoted, with adequate control at lower speeds. A good flight deck was important, as well as adequate provision for rest stations. Gear for dropping of depth charges or bombs should be so designed that re-loading was easy and quick. A twin-engined aircraft having a range of 1,500 miles with war load, or 2,000 miles without, would be his conception of an ideal aircraft.

Independence of a specially constructed aerodrome is one of the most important features of the flying-boat, and this feature confers improved mobility and routing as compared with large land planes. This is of special importance in the East, where the construction of airfields might be difficult or impossible. It has been suggested that flying-boats should operate from ports already used as naval bases, and this would obviate airport defence, while in any case ground control approach would never be necessary, as the aerodrome is unlimited

One disadvantage is that there are certain difficulties in maintenance, refuelling, and re-arming in the field ; but authoritative articles in official publications have provided a remedy : the construction of pontoon docks not very dissimilar from those at one time used by B.O.A.C., giving all the facilities for servicing of heavy aircraft which are normally available at an aerodrome or airport on land.

The indispensable Short Sunderland is still with us, and a replacement is long overdue. It was built to Air Ministry Specification R.2/33, and is a four-engined general reconnaissance aircraft. Reports from Korea and Malaya have stressed its great usefulness. It was the first flying-boat to be fitted with gun turrets.

The Short Solent, widely used by B.O.A.C. and still in use by Tasman Empire Airways, is developed from the Seaford, which in turn was developed from a Sunderland military Specification R.8/42. A maximum of eighty passengers can be accommodated in utility conditions, or (in Solent 6) about 100 natives with 15 lb. of baggage each. The Tasman-type accommodates forty-two passengers in luxury.

Short Sealand is a small twin-engined amphibian built chiefly, nowadays, for export ; and exists also as a flying-boat without landing gear. The amphibian will carry five to eight passengers ; and the flying boat ten when no toilet compartment is fitted.

In time of war almost any large aircraft originally intended for passenger use might have to be used as a military transport, and since unfortunately the excellent Short Shetland will not be ordered it may be that the two Saunders-Roe " Princess " flying-boats with their ten " Proteus " propeller turbine engines and cruising speed of 385 m.p.h., having a capacity for 80-120 passengers and a maximum range of 5,500 miles, may be used for this alternative purpose. The size of these boats would enable large quantities of spares and stores, including engines for repair or even dis-

mantled aircraft to be transported, always presuming sufficiently large dimensioned entrances are incorporated. It is believed that the two or three main flying-boat firms have even more modern-type projects on their boards, although only Saunders-Roe have issued particulars with regard to their projected Duchess, the performance of which would appear to surpass that estimated for its predecessor.

If we go on the experience of the United States of America, a large long-range patrol flying-boat would exceed the all-up weight specified in the R.U.S.I. lecture. From the latest details of the American Navy's newest weapon it is obvious that they would go well beyond flying-boats corresponding to an all-up weight of 80,000 lb. and a speed of 180 knots. Convair XP5Y-1 weighs 60 tons gross and has a speed of more than 350 m.p.h. It has a high ratio of length to beam, and is said to take off in less than 30 seconds; it is the first of the big flying-boats to use gas-turbine-driven propellers, a logical development for any long-range craft, whether flying-boat or land plane.

Another American flying-boat is the Martin P5M-1 Marlin, an improvement of their well-known Mariner. The hull is said to be improved, in that the keel is underwater from nose to tail, making for greater stability than their previous designs with a high step or break in the bottom. A complete range of electronic submarine detection devices is included, as well as heavy armament. A crew of seven is required, and this flying-boat can also be modified to serve as a cargo or general utility carrier.

The only all-jet flying-boat at present is the Saunders-Roe SR.A1 jet fighter, powered by two gas turbines. It is a single-seater of very graceful appearance; but little or no performance details are yet available. The pilot is located in a pressurised cabin and provided with emergency ejection device; the armament is stated to be four 20-mm. cannon positioned in the nose of the hull with a covering plate for ease in re-arming.

There are rumours that the Hughes flying-boat, the largest aeroplane in the world, is about to emerge from temporary retirement and take the air again. It is produced by Hughes Aircraft Company of Culver City, California, and spans 320 feet, with a length of 219 feet. It is capable of carrying 700 persons, and has a total all-up weight of 180 tons. Its only flight was in November 1947, when during taxiing tests it was lifted from the water by Mr. Howard Hughes, the President of the company, and flown for a mile about 80 feet above the sea.

TRAINERS

An article in the *Aeroplane* dated March 9, 1951, by John Fricker summed up the developments in training which have taken place during the last twelve months. The gap between primary training and operational types has considerably widened with the coming of jet aircraft; and both in this country and in America training aircraft can be clearly divided into primary trainers specially built for that purpose and operational aircraft modified for training purposes.

In this country available primary trainers include Auster AOP Mark 8, de Havilland Chipmunk, the Fairey Primer, Handley Page HPR 2,

Percival P56 and P40 Prentice; and in America the Beechcraft Model 45 Mentor and Temco TE-1A Buckaroo.

Until recently in this country the progression in aircraft used to be Tiger Moth, Master, and Oxford for twin-engine conversion; Tiger Moth will now be replaced by Percival Prentice, a three-seat trainer; and the Percival P56, built to Specification T.16/48, has been selected as the new basic trainer; the first few aircraft will be fitted with Cheetah engines, the remainder with Leonides as the latter become available. Another competitor for selection as a basic trainer was the Handley Page HPR2; both these aircraft have tail wheels.

The de Havilland Chipmunk has been selected to replace the Tiger Moth as the standard primary trainer in all R.A.F. Volunteer Reserve flying schools; it was originally designed and built by de Havilland Aircraft of Canada Ltd., and is now in production in de Havilland factories in England. The engine is a Gypsy Major 8 of 145 h.p.

Of the advanced trainers used in this country, it is anticipated that Boulton Balliol T. Mark 2 advanced trainer will replace the well-tried Harvard; Balliol Mark 2 is powered by a Rolls Royce "Merlin" 35, of 1,245 h.p.; Balliol Mark I was a prototype with an Armstrong "Mamba" turboprop. Another advanced trainer is Avro Athena, a two-seat trainer for advanced flying training, day and night navigation, gunnery, bombing, and photography. This aircraft also is at present equipped with a "Merlin"; but previous Marks have had "Mamba" and the Rolls "Dart" turboprops.

Reference should be made to the Vickers Varsity, a twin-engine multi-purpose aircraft intended for an advanced aircrew trainer; it can be applied to simultaneous training of pilots, radio operators, navigators, and bomb-aimers, all under the guidance of instructors.

Beyond these aircraft, built originally as advanced trainers, there are the jet trainers such as Vampire or Meteor, previously mentioned amongst the variants of these high-speed aircraft; to them should be added another fast aircraft, recently modified as a trainer, either for armament work or as a deck-landing conversion trainer, Fairey Firefly T. Mark 1; the power plant is a Rolls Royce "Griffon 12" of about 2,000 h.p.

In the United States of America primary trainers are produced by Beechcraft and Temco; North American Aviation are understood to be producing in quantity a new trainer, T.24A, which is a two-seater advanced trainer with a Wright 800 h.p. engine. Their basic trainer is T-6G, with a 600 h.p. Pratt and Whitley engine.

Lockheed claim that their T-33A Shooting Star two-seat trainer is the only American jet trainer, intended to give students the feel of 600 m.p.h. flight. The engine is an Allison J-33, which would at that speed develop nearly 10,000 h.p.; this is approximately half the power of the Gloster Meteor trainer.

As crew trainers both Martin and Convair produce large aircraft from designs originally intended for air liners. The Martin Airlift is twin-engined and capable of 270 m.p.h.; almost immediately the existing piston engines will be replaced by turboprops.

Convair T-29 navigational trainer has been styled "The Flying Classroom." It is based on the forty-passenger Convair liner and has a gross weight of nearly 20 tons.

LIGHT AIRCRAFT FOR MILITARY USE

Although it has been available for some time, the orders placed for the most ubiquitous of military liaison aircraft are small: it is the Boeing L-15. It is thus described in an issue of the *Boeing Magazine*:

The L-15 was developed by Boeing as the result of a postwar army request, asking the aircraft industry to submit designs for an artillery-spotting liaison plane.

It frequently must land—and take off again—on small pieces of ground entirely surrounded by trees, or on small, hastily improvised landing fields.

Its plexiglass-enclosed gondola was designed as an aerial observation post more effective than a whole battlefield full of ground-level OPs. Pilot and observer have a sweeping, all-round view, including directly below the plane and directly aft; the observer's seat may even be swivelled about so that he is facing the rear.

The L-15 can remain aloft at speeds as low as 36 m.p.h. It can jockey in for a safe landing as 32 m.p.h. Yet, with equal safety, it can attain a diving speed of 200 m.p.h. if it finds itself under attack by enemy aircraft.

To permit sustained operation at observation speed, the plane's 21-gallon fuel tank will keep it in the air for four hours.

Its novel fuselage shape embodies a large rear door through which personnel, supplies, or ammunition may be dropped or messages picked up. Through the same door, cockpit equipment may easily be changed to suit whatever the plane's current assignment may be.

The L-15 may be converted to a float-plane or snow-plane by the simple installation of floats or skis in place of the normal landing gear. With no conversion at all, it can be towed by a troop carrier plane—glider fashion—and can be cut loose to continue or to land under the power of its own engine.

For operation from areas too small for normal landing and take-off, the L-15 is designed for installation of a hook that will permit it to use the Army's unique Brodie arresting gear—a length of wire that catches and slows the plane, suspending it just above the ground. With the same device the plane can take off almost from a dollar bill.

The light-weight L-15, whose normal gross weight is only 2,050 lb.—in contrast to the 135,000 gross of the YC-97—can be quickly disassembled and put together again. Wing panels may be easily detached by removing four pins; the full cantilever type, 47-lb. landing gear is attached to the fuselage by only two bolts.

HELICOPTERS

In this country five firms manufacture helicopters; and in America more than a dozen. The British firms are Bristol, Saunders-Roe, Fairey, and Westland; a firm styled Hoppicopters at Bournemouth are understood to have the rights of the American Hiller three-seater.

Despite the number of American firms engaged in production of helicopters, only five have production orders for the Services, most orders being placed by the United States Navy. Those firms are Bell, Hiller, Kaman, Piasecki, and Sikorsky.

Helicopters being built to-day are classified under the following headings: two co-axial rotors; twin rotors; single main rotor with an auxiliary rotor at the tail; and a single rotor with power units in the blades.

Speaking at a meeting of the Helicopter Association of Great Britain in September 1950, Major-General R.H. Bower, C.B., C.B.E., Director of Land/Air Warfare at the War Office, said:

Three types of helicopter were required by the Army. The first was a light two-seater for A.O.P. use in areas which precluded the construction of

airstrips. Then a four-seater was needed for such purposes as evacuating casualties (a few such aircraft were already operating in Malaya), and for the movement of commanders and staff, message-carrying, mail-delivery, and so on. Next there was a general purpose type which, it was hoped, would be made really easy to fly. It had been agreed that these machines, operating forward of Army Headquarters, should be flown by Army pilots, but it was not expected that officers could be provided for the purpose: pilots would be mainly sergeants, of the type who flew the gliders in the last war. Finally, there would almost certainly be need for a heavy-lift helicopter, unless some genius could produce a "converterplane" which would get the best of two worlds. The heavy-lift type should have a payload of the order of three to five tons.

It seemed that provision of the first two types named would not be too much of a problem, except in initial cost and in training pilots. The heavy-lift helicopter, however, was a much more difficult proposition, and the speaker explained why he thought that the Army would require it. There were, he said, both tactical and administrative advantages to be gained. Tactical applications would probably include the landing of troops and stores from ships in combined operations; coup-de-main operations; quick forward movement of bridging materials; crossing of minefields or rivers; and even the establishing of radar stations on hilltops. Movement of troops and reserves was a further application, and it might even be possible to use helicopters on airborne operations, if remote from enemy defences. At present it was thought that these tactical advantages would be somewhat reduced by the great vulnerability of helicopters. There was, therefore, a case for improvement in their power of manœuvre, particularly in rapid descent, which might give some measure of protection against enemy fighters. Major-General Bower felt that this vulnerability factor was such that the main use of the heavy-lift helicopter would lie in areas out of range of A.A. and small-arms fire.

On the administrative side there were great possibilities, which lay in the helicopter's great flexibility and in the fact that it could move stores direct from base to user, thus eliminating the need for many handlings by large numbers of men. In terms of administrative advantage there should be big dividends, not only in economy of road transport but also in such matters as wear and tear of certain key roads, elimination of the need for bridges, and so on.

Against these requirements, Table VI shows the British and American heavy helicopters that are available—the Saunders-Roe Cierva Air Horse, twenty-four passengers; a Bell helicopter which would take a total of eight people or six stretchers; Piasecki with two crew, able to carry six stretchers; and a new Sikorsky to take ten passengers in addition to a crew of two. Six to eight stretchers could be installed in place of passenger seats. Although this large helicopter might be considered a big aircraft, it has been designed so that it can be quickly dismantled aboard one of the immense American cargo planes for long-distance travel. It will carry up to 2,000 lb. of payload for a range of 280 miles at sea level, the speed being over 100 m.p.h. With fuel and pilot alone, the ferrying range exceeds 1,000 miles.

This is one of the entrants for the Arctic Air Rescue Evaluation; the other three are McDonnell, Piasecki, and Bell. The Piasecki entry is their H.21, which has provision for twenty seats, although twenty-seven persons could be seated on the floor of the large cabin. Not very much information seems to be available in regard to the Bell and McDonnell entries; it is stated that with a larger engine the Bell production could take as many as eleven passengers seated in three rows behind the pilot.

Up to the end of 1950 the Sikorsky helicopters in Korea evacuated or

rescued 1,200 wounded United Nations personnel. In addition, large numbers of men of all nations were led to safety, and sometimes to evacuation, by means of a helicopter giving them guidance.

The Sikorsky helicopter is intended to be used by the United States Navy for anti-submarine work, and the Navy has discussed the employment of a pair of these craft, one to find the submarine and the other to kill it; the search aircraft will be equipped with radar sufficiently good to locate a submarine using the Schnorkel.

An article in the *United Aircraft Corporation's Journal*, for Summer 1950 says that this type of helicopter is suitable for launching a torpedo by lowering it gently into the water, pointing the warhead towards the submarine, and letting go. It can be applied also to searching for enemy submarines ahead of the convoy, and yet be only a few minutes away.

The British-made Westland helicopter is based on the Sikorsky design, and one of them has been applied to experimental work in the Arctic, particularly on air/sea rescue. It can, of course, be applied also to help service vessels to navigate through icefields. Ambulance equipment has been fitted to this British-made aircraft; it has been applied to night mail work, and has dropped supplies to the marooned crew of a lighthouse.

As regards the future, an authoritative article says that the trend of improvement is likely to require the following development:

- (i) Good control, visibility, and stability for operation into city centres, perhaps involving a steep approach with slow forward speed.
- (ii) More than one engine, for operation over water or into the centre of cities.
- (iii) Low operating cost and a considerable price reduction; some steps in this direction will be taken when sales of helicopters increase.
- (iv) Some increase in speed, to ensure regularity of service in adverse winds.

Turning again to Table VI, Bell Model 48 is to be applied to tactical missions, personnel evacuation, cargo transport, observation, liaison-co-operation, objectives, and fire direction. It has flotation gear for landing on water, a rescue hatch, and a hoist to lift stretchers and life rafts.

The Hughes Aircraft Company, builders of the huge flying-boat referred to earlier, is building a helicopter for the United States Air Force. It will be remarkable for the size of its engines, two General Electric turbines feeding compressed air to jet units at the tips of the rotor blades. Engines and rotor have already been assembled on a test rig, but this does not give any idea of the size and appearance of the completed aircraft. This large helicopter is intended to be used by the Air Force as a flying crane to lift loads up to 10 tons and carry them 65 miles. The first aircraft should be ready in 1952, for prototype trials by the Air Force in 1953.

During the last twelve months American helicopters have been towed for hundreds of miles, greatly extending their range. An automatic pilot for helicopters has been devised. Ordinarily, a helicopter has to be continuously "flown" and automatic control will be welcomed by pilots.

AIRSHIPS

In the 1950 edition of Jane's "All the World's Aircraft" there was once again a very small section devoted to airships. With the exception of those being made in the United States, the small number described are all experimental. Great Britain has a small non-rigid airship being built by the Airship Club under the direction of Lord Ventry; it is 45,000 cubic feet capacity and is 108 feet long. France has built a motor-balloon for advertising purposes, about 36,000 cubic feet; Russia is using a dirigible, possibly of war-time origin, very similar to those built by Goodyear in the United States of America. "Jane" gives the length as being 157 feet.

This leaves the United States airships, specially built for the Navy either for airship training or patrol duties. The most up to date of these is the N class patrol airship under construction with a capacity of 875,000 cubic feet. The length is 324 feet and the maximum diameter 71 feet.

G class airships are used as advanced trainers and for experimental purposes; they are 190 feet long by 45 feet maximum diameter. Between class G and class N there are airships of classes K, L, M, and XM, gradually increasing in size; the only class XM airship built holds the world's duration record.

GUIDED MISSILES

In "Gas Turbines and Jet Propulsion," by G. Geoffrey Smith, there have been illustrations of British missiles, generally on the lines of the German rocket styled V.2; in the same publication and in a number of engineering and aviation journals full details of the German V.2 appeared soon after the war ended. Both this country and the United States of America came into possession of a number of samples; and since the war the Americans at least have produced similar rockets, greatly improved. Though these missiles would be useful in war, those which have been fired off by the Americans have been applied chiefly to certain forms of high-altitude research.

Neither the German V.1 (styled the Flying Bomb) nor the V.2 was guided in the sense in which we understand that word to-day; "guided" nowadays means that the missile, which may or may not have wings, carries some kind of radio receiver, which by connection to the controls can to some extent direct the missile or pilotless aircraft. Receipt of signals presupposes some kind of an aerial, and an efficient aerial would be half the length of one wave of the controlling signal. Radio and radar signals to-day may be transmitted on very short waves (styled alternatively ultra-high frequency) and the height of aerial to receive such a signal might be less than an inch. Both in high-speed aircraft and in missiles a tiny aerial such as this may be flush with the surface or "suppressed," and Boeing have published a photograph showing such an aerial being fitted to B-56, the Atom Bomber.

As regards the control of a missile or pilotless aircraft, there appeared recently in the *Aero Digest* (February 1951) an article entitled "Proportional Radio Control." This provides a good deal of information, presumably now no longer secret, dealing with current problems in connection with pilotless aircraft and guided missiles. The article showed that pilotless aircraft carried a small aerial or antenna, to which in the aircraft

would be connected a receiver, a demodulator, and a series of servo-amplifiers and positioning units. The latter convey to the controls external instructions by signal in regard to power, altitude, direction, pitch, roll, and yaw.

For some time the Americans have been equally candid about their various types of guided missiles, with various applications. Those already being made in quantity may be placed in the following categories :

- (i) High-altitude missiles generally on the lines of the German V.2. The best example is possibly the Martin Viking.
- (ii) A rocket-propelled guided missile, for air-to-air use, virtually a fragmentation shell with proximity fuse, such as the Ryan Firebird.
- (iii) Guided bombs such as the U.S.A.F. 12,000-lb. Tarzon (this is the correct spelling). It has been used in Korea.
- (iv) Ground-to-air guided missiles, such as the Fairchild CTV-N-9a guided missile.

Not only Government departments and great firms are engaged in research on these problems; universities such as Princeton and other similar teams have been carrying out investigation into the problems of guided rocket missiles. Another article a year ago was entitled "Anti-Bomber Rocket Missiles"; these are intended for ground defence against mass-bombing attacks. Looking into the future, the author visualises a rocket with a proximity fuse discharged from an anti-aircraft shell at 30,000 feet altitude, and goes on to say :

The guided, jet-propelled missile may be radar-directed, gyro-controlled over a predetermined course, or equipped to track and destroy an enemy plane, its proximity fuse accounting for at least a "near miss."

It would be an object, also, to steer the missile by modifying the propulsive action of the rocket-jet to afford a counter-dispersion effect for returning the missile to its course. Automatic steering means, such as a gyroscope, may be employed, as the missile may be remotely controlled.

The high-altitude research rockets applied to exploration of the outer atmosphere up to heights of as much as 250 miles for a small one or 150 miles for the Martin Viking, were described in *Aero Digest* in September 1950. That article illustrates a combination of a large rocket with a small one in its head, and this is the device which reached 250 miles high. This type of rocket will be adequate to supply the user with an inexpensive device for upper atmospheric research; and the very large and costly Vikings could then be held in reserve for any offensive use which may develop.

The United States Navy has taken a very great interest in offensive weapons of this type; and has converted a vessel (U.S.N. Norton Sound) specially for the firing of Viking-type rockets. Similarly, at least one of these great rockets has been launched from a staging on the deck of a carrier, U.S.N. Midway; and it has been pointed out that after the launching of one or more rockets from this staging, the deck can be cleared within an hour to allow aircraft to land on or take off once more. American articles point out that it is not necessary for them to design rockets to travel thousands of miles, though this is practicable; instead, they regard Viking and similar missiles as being available for use from carriers, to be launched wherever the Atlantic Powers control sea and air.

Air-to-air missiles, such as the Ryan Firebird, are launched from a jet-plane; it has the speed of the parent fighter, plus the added power of its own booster rocket, and finally its flight rockets. It is stated to have a complicated radar navigational and electronic system, but in addition is intended to home on the enemy target. The launching plane must have radar capable of spotting and tracking the enemy's aircraft. This missile is 10 feet in length and only 6 or 8 inches in diameter; and more than one can be carried on external launching racks intended for standard bomb installations. The wings are of 3 feet span; and should the missile miss its target, the warhead is automatically detonated in the air.

Not much information has been made available in regard to a guided bomb, guided apparently while bomb and target are still together visible in the eyepiece of the bombsight.

The Firebird ground-to-air guided missile has been designed as a target for ground firing, but could equally well be applied to direction, or alternatively homing, on enemy aircraft. It can be launched from a platform which would take up little more than 10 feet each way, since the missile is propelled by its own reaction-type motors and auxiliary booster. The separation of the booster occurs as the missile attains altitude, stabilised and controlled by the engines of its electronic guidance systems. Even when it is under its own homing control, the launching crew are still able to plot the path of the missile.

In addition to Firebird, Martin have produced a high-speed target aircraft styled the Gorgon. It is powered by a ram-jet, and could doubtless be launched by a small catapult or rocket, but this is not stated. It is stated that these "drones" have at least the speed of the very fastest fighter planes, so as to extend the capabilities of the anti-aircraft gunners of the surface Fleet. They are remotely controlled by radio, and could therefore be used as a missile as well as a target; the target is recoverable, when the fuel is exhausted, by means of a parachute.

In the September 1950 number of their journal *The Martin Star*, the speed of the Viking has been stated at 3,600 m.p.h.; and an unobtrusive paragraph in the same journal refers to production orders for "digitars," which convert radar readings into numbers and upon which the electronic control of guided missiles depends.

THE TREND OF DEVELOPMENT

When Sir Miles Thomas, himself an ex-pilot, returned from the United States, he said that a number of their heavy bombers were mysteriously described as "suitable." Since that visit, one or two of the American aviation journals have become more revealing, and there is little doubt that all the jet-bombers, and at least one of the others, Convair B.36, would carry an atom-bomb. For nearly a year, American journals have been saying that Great Britain had four prototypes of four-jet bombers under construction; and in June the first of them was flown, Vickers 660; American journals instantly declared that its bomb-bay was of a suitable size.

In July of 1951, the Douglas Skyrocket was flown at speeds far beyond the so-called sonic barrier. It is an all-rocket aircraft in which the pilot lies prone to minimise the possibility of blackout.

G. W. WILLIAMSON

TABLE I
SOME 650 M.P.H. JET AIRCRAFT

Name and Type	Span	Weight, lb.	Thrust, lb.	E.H.P.*	Thrust/ Weight Ratio
de Havilland Venom ..	41' 9"	12,000	5,000	5,000	0.41
Gloster Meteor	37' 2"	15,175	14,400	24,400	0.96
Hawker P.1052	36' 6"	—	5,000	9,000	—
Vickers S.510	38' 3"	—	5,000	9,000	—
Consolidated Vultee XF.92A	31' 0"	13,600	4,600	8,400	0.35
Grumman Panther ..	38' 0"	17,000	6,200	10,800	0.36
MacDonnell XF.88 (Voodoo)	39' 8"	15,000	6,000	10,400	0.40
North American Sabre ..	37' 1"	13,715	5,000	9,000	0.36
Republic XF.91	30' 0"	15,000	5,000	9,000	0.33
Sud-Ouest SO.6020 ..	34' 9"	17,637	5,000	9,000	0.29
Saab J.29	38' 1"	—	5,000	9,000	—

* E.H.P. is Equivalent Horse-Power at 650 m.p.h.

TABLE II
NIGHT OR "ALL-WEATHER" FIGHTERS

Maker and Type	Span, ft.	Weight, lb.	Thrust, lb.	E.H.P.*	Thrust/ Span †
Avro (Canada) CF.100 ..	52	—	13,000	17,300	4.8
de Havilland Venom ..	38	—	5,000	6,600	3.5
Lockheed F.94	38	15,000	4,600	6,100	3.2 c
Northrop F.89, Scorpion	56	30,000	10,000	13,000	3.3

* E.H.P. is Equivalent Horse-Power at 500 m.p.h.

† As weights are not known, performance may be arbitrarily compared, for these four aircraft, by the ratio of thrust divided by the square of the span.

TABLE III
LARGE BOMBERS, ALL-JET OR JET-ASSISTED, IN ORDER OF SIZE

Maker and Type	Span, ft.	Weight, tons	E.H.P.*	Remarks
Consolidated Vultee (Convair) B.36 ..	230	163	53,000	Maximum range, 10,000 miles. Maxi- mum load 42 tons.
Northrop YB.49 ..	172	105	64,000	The "All-Wing" air- craft.
Boeing XB.47 (or 56) ..	116	82	48,000	The "Atom-Bomber." Speed over 600 m.p.h.
Consolidated Vultee XB.46	113	45	32,000	Speed 500+.
North American R.B45C	90	50	32,000	Speed 550+. Range 1,200 m.
English Electric Canberra	64	20	21,000	Speed 555. Range 1,500 m.
Martin XB.51	55	7	15,000	Maximum speed, 600 m.p.h.

* E.H.P. in the Equivalent Horse-Power at 550 m.p.h.

TABLE IV
LARGE MILITARY TRANSPORTS

Maker and Type	Span, ft.	Weight, tons	H.P.	Maximum Load and Maximum * Range
Consolidated Vultee Con- vair) XC.99	230	132	18,000	50 tons; 8,000 m.
Douglas C.124.A ..	173	87	14,000	25 tons; 6,280 m.
Boeing C.97.A	141	73	14,000	34 tons; 3,750 m.
Blackburn and General Universal Transport	162	47	7,000	14 tons; 1,750 m.
Handley Page Hastings	113	36	6,700	9 tons; 3,886 m.
Fairchild XC.120 ..	109	36	6,500	9 tons; 1,150 m.
Chase XC.123 ..	110	35	4,800	14 tons; 5,060 m.

* Maximum range is stated for a military load much less than the maximum.

TABLE V
FLYING BOATS

Maker	Mk. or Number	Weight (tons)	Speed (max.)	Range	Total H.P.
Saunders-Roe	Princess (under construction)	140	380	5,500	35,000
Saunders-Roe	S.R. A.1, jet fighter, single-seater	6.5	—	—	11,000
Short . . .	Sunderland	27	213	2,690	4,800
Short . . .	Solent	35	276	2,200	8,160
Short . . .	Sealand (t/e amphib.)	4	189	425	850
Convair . .	XP. 5.Y.1, long range, patrol	60	250	—	22,000
Grumman	Albatross amphibian	—	270	1,400	2,850
Grumman . .	Mallard	56	215	1,380	1,200
Martin . .	Marlin P.5.M.1	—	—	—	6,000
Martin	Mars	65	222	—	12,000

TABLE VI
HELICOPTERS

Maker	Name	Seats	H.P.	Total Wt.
Bristol	Type 171, M. 3	4/5	550	5,200
Cierva (Saunders-Roe) . .	W. 11, Air Horse	24	1,620	17,500
Fairey	Gyrodyne	4/5	525	4,800
Westland	S.51, Dragonfly	4	500	5,700
Breguet	Gyroplane	4	450	2,100
Bell	Model 48	5/8	550	6,286
Gyrodyne	GCA, Model 2	5	450	5,400
Piasecki	PV3, Rescuer	2/8	600	6,900
Sikorsky	S.55	12	600	6,800
Sikorsky	S.52	3/4	245	2,400
Sikorsky	S.51	4	450	5,500

TABLE VII
SOME LARGE PROPELLER TURBINES

Maker and Type	Shaft horse-power	Thrust, lb.	E.H.P.*	Weight, lb.	Pounds per H.P.
ARMSTRONG					
Mamba II	1,280	384	1,654	780	0.45
Double Mamba	2,540	770	3,310	2,000	0.60
Python	3,670	1,150	4,820	3,150	0.65
BRISTOL					
Theseus	2,220	825	3,045	2,205	0.73
Proteus	3,200	800	4,000	2,900	0.72
Coupled Proteus	6,400	1,600	8,000	8,106	1.00
NAPIER					
Naiad	1,500	241	1,741	1,100	0.65
Double Naiad	2,970	482	3,452	2,200	0.65
ROLLS					
Clyde	3,500	1,200	4,700	2,500	0.55
Dart	1,400	310	1,710	850	0.50
ALLISON					
T38	—	—	2,750	1,225	0.45
T40	—	—	5,500	3,000	0.55
TURBODYNE					
Model XT-37	—	—	10,000	—	—

* E.H.P. is Total Equivalent Horse-Power at 375 m.p.h.

TABLE VIII
LARGE ALL-JET TURBINES

Name and Type	Thrust, lb.	E.H.P.*	Weight, lb.	Weight/H.P. Ratio
ARMSTRONG				
Sapphire	7,200	12,500	—	—
ROLLS-ROYCE				
Avon	6,500	11,300	2,400	0.21
Tay	6,500	11,300	2,000	0.18
Nene	5,000	8,700	1,550	0.18
DE HAVILLAND				
Ghost	5,000	8,700	2,011	0.23
AVRO (CANADA)				
Orenda	6,500	11,300	2,900	0.25
ALLISON (U.S.A.)				
J.33 (Model 400)	4,600	8,000	1,795	0.23
J.35 (Model 450)	5,000	8,700	2,260	0.28
J.35-A-23	9,800	17,000	—	—
GENERAL ELECTRIC (U.S.A.)				
J.47 (G.E.TG.190)	5,000	8,700	2,500	0.29
PRATT AND WHITNEY (U.S.A.)				
Turbo-Wasp, JT.6B (Nene)	5,000	8,700	1,723	0.20
J.48 (Tay)	6,500	11,300	2,000	0.17
WESTINGHOUSE (U.S.A.)				
J49-WE-2	7,500	—	—	—
WRIGHT (U.S.A.)				
Typhoon YJ-65	7,220	12,500	2,500	0.20

* E.H.P. is Equivalent Horse-Power at 650 m.p.h.

CHAPTER XXXI

AIR LESSONS FROM KOREA

THERE HAVE been many puzzling aspects of the campaign in Korea, of which not the least has been the apparent failure of air power to exercise any great influence upon the course of events. Here we have had a situation in which the United Nations forces enjoyed practically complete air supremacy both before and after the intervention of the Chinese, and yet their forces were almost thrown into the sea at the outset of the campaign, and subsequently, after their triumphant advance to the Yalu River, were driven back headlong south of the 38th Parallel.

At the time of writing, May 1951, the Allies, after stabilising the front for some time along a line running east and west just south of Seoul, had advanced to a line roughly along the 38th Parallel, where they came up against strong resistance. It is proposed to analyse the influence of air power upon events up to that date in order to deduce what lessons can be learnt, and, as a background to this analysis, a summary of the various stages of the campaign follows.

The original act of aggression by the North Koreans occurred on June 25, 1950, when they crossed the 38th Parallel; and the first American troops arrived in Korea on July 2. By the end of August the Allied forces had been driven into the south-east corner covering the port of Pusan, and at the time it looked as though they might well be expelled ignominiously from Korea. However, this dark period was followed by the Inchon landing, which commenced on September 14, and the subsequent rapid advance to the Yalu River, culminating in General MacArthur's unfortunate "home by Christmas" message to the troops. For the moment it did look as though the machine, in the shape of the enormous industrial resources of the United States, had overcome the man. Over 250 ships were used for the Inchon landings, and tanks, aircraft, guns, transport, and supplies were poured in as the Allies swept triumphantly forward, but at the Yalu River disillusion awaited them, as it soon became obvious that only the first, and less serious, phase of the war had ended. A large part of the North Korean army was withdrawn successfully and regrouped in the sanctuary of Manchuria, whilst at the same time the build-up of the Chinese forces made it all too evident that a large-scale offensive was imminent. This offensive when it came drove the Allies back at an even more rapid rate than they had advanced, and compelled the hazardous, but magnificently executed, evacuation of the X Corps and the Marines through the port of Hungnam. Indeed, at one time it looked as though nothing was going to stop the advance of the Chinese and North Koreans, and that once more the Allies were in grave danger of being driven into the sea. However, eventually the line was stabilised south of Seoul, and from there the Allies advanced slowly to the 38th Parallel, where their further advance was halted by strong resistance.

Experience in the world war had seemed to prove, if it had proved anything, that air superiority was an essential pre-requisite to a successful

offensive in modern warfare. The air opposition put up by the North Koreans was practically negligible, and although a little more was encountered after the intervention of the Chinese, it could, for all practical purposes, be discounted (only ten American aircraft were shot down up to January 19). And yet the Allies, who have not only air superiority but what could more correctly be described as complete air supremacy, have had the worst of the campaign to date, and that against an enemy who is nothing like so well armed and equipped.

What are the reasons for this? First and foremost is probably the American belief in the results likely to be achieved by strategic bombing. Their experience of the war in the Pacific, where the Japanese were defeated by sea and air power without the need of any landing on the Japanese mainland, coupled with their possession of the atom bomb, helped to colour their views on the value of strategic bombing. They tended to overlook the fact that it can only be fully effective against a highly organised industrial community with a well-developed system of communications, whose army is organised on European lines and dependent on the country's industry and communications for its supply and movement, and that even in Europe, where these conditions obtained, strategic bombing had not by itself proved decisive.

The Americans therefore gave first place in the post-war organisation of their forces to the strategic bomber, and, in spite of a violent controversy with the Navy, who attempted to decry the value of the strategic bomber, this policy was adhered to up to the outbreak of the Korean war. As a result, there were many people in the United States who imagined that the Air Force would finish off the war, almost in a matter of hours, without requiring any assistance from the other Services. When it became evident that the war was going to be a long-drawn-out and costly affair, criticisms of the Air Force were voiced freely, one school of thought bluntly maintaining that the Air Force had failed, and the other that the cause of the failure was that the post-war demobilisation of the Services had reduced the Air Force almost to impotence. The following extract from the *National Air Review* of October 1950 gives a vivid picture of the original American reactions.

The word which reached Tokyo on the night of June 27 announcing that General MacArthur had been authorised to commit U.S. Air Force units in defence of South Korea, was immediately followed by predictions of a seventy-two-hour pushover. Reporters, rushing to get to the front, had already decided it would be all over before they even had time to dig old war correspondents' uniforms out of stateside attics. Then, as the days wore on and North Korean tanks and troops swept deeper and deeper into South Korea, disillusion and even shocked surprise set in because the Air Force single-handedly had not been able to stop the enemy cold. The fact that American ground troops were later committed was viewed by some critics as a blunt admission that air had failed.

The real truth seems to be that strategic bombing has failed to be decisive, or to exercise any major influence on the operations, not because of inefficiency or lack of strength, but simply because the conditions were not suitable for the effective employment of strategic bombers. Although the main industries of Korea are located in the North, and were largely put out of action by the air attacks, the North Korean army was by no means mainly dependent upon them, or on the scanty communications,

which were also effectively attacked from the air. Nor did the fact that the North Koreans received supplies and reinforcements from across the frontier materially contribute to their early successes, or to the subsequent success of the Chinese after their intervention. The success of both forces appears to have been due mainly to their loose tactical organisation, which enabled them to move freely across country independently of the roads, their ability to live largely on the country, their large numbers and almost complete indifference to losses.

The Americans, on the other hand, seem to have been bogged down by their own efficiency in supplying and moving their troops. There was such a superfluity of transport and supplies of every description that the troops seemed to be incapable of operating without it. The North Koreans took full advantage of this weakness, and most of the early withdrawals were forced upon the Americans by the infiltration, often in darkness, of the enemy behind their lines across hill ranges that were considered impassable and were consequently undefended. At the same time there is no doubt that the North Koreans were well led. Their higher organisation was efficient, they fully realised their own limitations and those of the Americans, and adapted themselves readily to the conditions. Even after their communications had been cut by the Inchon landing the command continued to function effectively, and to maintain some form of control over its formations. As a result, although they suffered heavy losses, they were able to withdraw a large proportion of their forces across the River Yalu to the sanctuary of Manchuria. There they regrouped, and advanced again in strength with the Chinese forces when they launched their offensive.

The United States Marines, on the other hand, were organised on much more mobile lines than the Army, and the fact that they were more successful was due largely to their greater adaptability to the conditions, to their independence of the roads and valleys, and to their ability to move freely across country. They were thus able to fight the North Koreans and Chinese on level terms. This was well exemplified by their advance after the Inchon landing, and by their magnificent conduct of the operations during the withdrawal from the Changjin reservoir to the port of Hungnam, through which the X Corps was eventually evacuated.

The views of Major-General O'Donnell, who was in command of the Far East Air Forces Bomber Command up to the middle of January 1951, are interesting on the results achieved by strategic bombing. On relinquishing his command he was reported in the Press as saying:

With the 43,000 tons of bombs we dropped we have done all the major damage in Korea. They have not got a single refinery left. They have no chemical potential, and their transport system is completely shot. The mission of strategic bombing is to destroy the economic health of the enemy. We have done that, as far as North Korea is concerned, although the country did not have much economic health to begin with. We have never been permitted to bomb what are the real strategic targets, which we are extremely capable of doing, and it is ridiculous to sit down and blame us for reverses in Korea.

The same view was voiced by General Vandenberg, the Chief of Staff of the United Air Force, during his visit to Tokyo in January 1951; he

said that strategic bombing of the enemy's bases would be the most effective way of dealing with the present situation

In a further interview with the Press after his return to the United States, Major-General O'Donnell said: "If we are going to fight, let us not hit them light. It is time people knew that this is an all-out war. This is a global war. We won the first round, but this is the second round and we are losing on points. I believe we should have cracked the Chinese Communists hard as soon as we had them identified. I am in complete accord with the United Nations, but it makes a very poor substitute for military headquarters in a campaign." He then went on to recommend the use of the atom bomb against Red China, and concluded by saying that, besides possible targets for atom bombs, there were "quite a few good targets for conventional bombing in Red China and Manchuria. We cannot continue to fight under the Marquess of Queensbury rules when we are fighting thugs who are going to hit us on the back of the head with an axe."

Then there have been the views expressed by General MacArthur to the Senate Armed Services and Foreign Relations Committee, when giving evidence in May 1951, after his dramatic dismissal by President Truman, during which he said that if he had been permitted to bomb the Chinese forces massed on the Yalu River they would never have crossed the river. He then went on to say that if he had been allowed to bomb their bases after they had crossed the river, they would not have been able to advance in any strength, but it was only when he protested to Washington that he was even allowed to bomb the bridges halfway across the river.

Whilst one can fully appreciate the sense of frustration which must have been felt by the men on the spot, when they were unable to take action against the North Koreans after their withdrawal across the Yalu, or against the Chinese when they were seen to be massing for the attack, one is left with an uneasy feeling that the bombing of targets in Manchuria or China would not, in fact, have materially affected the course of the campaign, even assuming that such action would not have precipitated a full-scale war with China, a possibility that cannot be ignored.

Assuming, however, that General MacArthur had been authorised to take action from the air against targets across the frontier, attacks would have been directed mainly against the Communist communications, supply depots, airfields, and troop concentrations, with the object of interfering with the movement of reinforcements and supplies to the front. In fact, precisely the same type of objective as those successfully attacked in North Korea, but which had failed to stop the original advance of the North Koreans. Under the circumstances it seems unlikely that attacks on targets in Manchuria would have proved any more effective. At the same time should the Chinese Air Force have to be taken seriously into account, however, their freedom to concentrate their aircraft on airfields just north of the Yalu might become a serious menace to our forces and compel a reconsideration of this ban by the United Nations.

There remains the question of the atom bomb. When the United Nations forces had reached the Yalu, and it became obvious that the Chinese forces were massing for an offensive, there was an outcry in the United States for the use of the atom bomb. As Alistair Cooke put it in one of his Letters from America, the man in the street was saying, with

pardonable irritation, "For goodness sake, why don't we drop that bomb?" At the same time there was a large body of opinion, in Asia in particular, but also in this country, which considered that the atom bomb should not be used under any circumstances. Such a view may be illogical and founded on sentiment rather than reason, but it is abundantly clear that opinion against the use of the bomb is so strong in many quarters that only overwhelming necessity would justify its use. This cannot be advanced in the case of Korea, and General Vandenberg specifically disavowed, on behalf of the American Chiefs of Staff, the views put forward by Major-General O'Donnell regarding the use of the atom bomb. The official views of the American Chiefs of Staff seem clearly to be correct. There are no industrial targets or enemy bases in Manchuria that would justify the expenditure of the enormous industrial effort represented by an atom bomb, and such targets as do exist, including concentrations of enemy troops, could be attacked just as effectively with normal weapons.

Whether the bomb should be used in the event of war with China is outside the scope of this article, but there certainly seems no case for its use as long as the conflict is confined to Korea.

Another factor that increased the early difficulties of the campaign was that the American preoccupation with strategic bombing had apparently led them since the war to neglect the development of tactical air forces. Consequently, in the early stages air support for the Army appears to have been lacking in several respects. Although better air support would not have provided the whole answer, as was shown after it had been improved, it would undoubtedly have helped to some extent to overcome the lack of mobility on the ground. Here again the Marines were better off in that they had their tactical aircraft under their own control. This is not necessarily an argument for giving the Army also its own tactical aircraft, as has been suggested in the United States. It is very easy to make false deductions regarding the use of air power from the campaign in Korea, and it must be remembered that there was no struggle for air superiority, which, where there is strong air opposition, has first to be obtained before adequate air support can be given to the ground forces.

The right answer seems to be to strengthen the development of tactical air forces. That this was a weakness in Korea appears to have been fully realised, as in November 1950 the Defence Department issued details of a re-organisation of the United States Air Force under which there are to be three Commands of equal status in the States, each reporting direct to the Chief of the Air Staff. At the same time it was announced that this re-organisation was required partly to meet the needs of the expansion programme, and partly to provide for the more effective employment of tactical and air defence units, as the experience gained in the Korean campaign had shown that changes should be made in the training methods for air co-operation with ground forces.

By the time of the Inchon landings on September 14 the early weaknesses in tactical air support had been largely overcome, and the brilliant success of this operation, followed by the rapid advance to the frontier, led to the mistaken belief that all our troubles were over. Following the opening of the second phase with the Chinese offensive, the United Nations have again had almost complete air supremacy, although there has been

some slight air opposition from the Chinese at times. This supremacy, together with the unchallenged command of the sea, enabled the X Corps and the Marines to be withdrawn through the port of Hungnam, but by and large air power once more does not appear to have had much influence on the course of the operations. The reasons for this appear to be partly the almost limitless manpower of the Chinese, who press on regardless of losses (one pilot reported that the Chinese did not bother even to take cover but just kept marching over the bodies of their dead, and there have been reports of tanks being charged by Chinese armed only with sticks of dynamite attached to bamboo poles) and partly the absence of suitable or worthwhile targets for air attack.

The Chinese forces, like the North Koreans, relied for their success on mass infiltrations behind the Allied lines, using the hills for movement, whilst the Allies were still largely road-bound. At the same time, the Chinese have little wheeled transport, and no highly organised system of supply and communications. They have few guns or tanks, and their troops are able to live off the country to a considerable extent, where the autumn harvest of rice was readily available to them. Nor were the rivers any great obstacle to movement during the winter, as they freeze over and can be crossed freely in most places. Air support therefore consists mainly of direct attacks on the enemy forces, but such attacks obviously cannot be decisive against troops employing the infiltrating tactics of the Chinese and who have unlimited manpower available to replace losses.

No accurate estimates of the numbers of Chinese and North Korean troops have been given, but 200,000 was quoted for the original attack across the Yalu, and since then the estimates issued by General MacArthur's Headquarters of the numbers massing for any big attack have generally been between 200,000 and 300,000. It seems therefore that the Chinese, together with the North Koreans, may well have disposed of some 500,000 or more men at a time in the field, with further large reinforcements readily available across the frontier.

Against this, when the Chinese offensive opened the Allies had some seven United States divisions, several South Korean divisions, and the various Allied contingents, making in all a force of about 200,000 men. In addition there were several thousand South Korean police and a large number of partisans organised for operations in the rear areas. On the face of it this disparity in numbers did not appear to be such that the Allied superiority in fire power, armour, and transport, coupled with their command of the sea and almost complete air supremacy, would not more than counterbalance the greater numbers of the enemy, but the fact remains that up to the time of writing the Allies have had the worst of the campaign, although their casualties have been much smaller, amounting, at the beginning of May 1951, to 170,000 South Koreans and 62,000 American and Allied troops, compared with an estimate of over 750,000 Chinese and North Korean casualties.

But the fact that air power has not been able to exercise a decisive influence on the campaign does not mean that it has not conferred immense advantages on the Allies. It may be that strategic bombing has achieved little compared with the effort expended, but the tactical air support, which has been increasingly effective since the comparative lack of it in the early days, has probably been the decisive factor in preventing the

Allies from being thrown into the sea. The air support provided by the land-based air forces and by the carrier-borne aircraft has been on an immense scale, and has meant that the Army has had large numbers of aircraft available at all times to assist them, not only in the purely land operations but also in the various landings and withdrawals on the coast. Similarly, airborne landings, such as that of several thousand parachute troops, with artillery and vehicles, in the Imjin river valley north-west of Seoul on March 22, can be launched at will, with complete freedom from interference by enemy aircraft.

At the same time the Army has been practically immune from enemy air attack, and this may well lead to false deductions being made from the Korean campaign regarding air power. The fact that the Allies have been very near defeat, in spite of their air supremacy, may result in the value of aircraft being decried, as it may be argued that their presence or absence has made little or no difference to either side in Korea. This view overlooks the fact that armies organised on European lines, and dependent upon a highly developed industrial community for their supplies, are far more vulnerable to air attack than are the Chinese or North Koreans. Can there be any doubt what the outcome would have been in Korea if it had been the enemy who had had the air supremacy?

Many students of war are now claiming that the main lesson of the Korean war is to prove the dominance of the foot soldier, when unencumbered by equipment and able to take full advantage of his natural mobility. This may be true in Korea, but does not necessarily help to provide the answer, as obviously the United Nations could not hope to match the Chinese forces man for man. If a solution cannot be found in a combination of fire power and armour with mobility, so as to compensate for lack of numbers, the outlook in Korea is bleak, but the campaign has at least helped to bring home the lesson that wars cannot be fought on preconceived lines, because the enemy is unlikely to be obliging enough to fall in with your views.

The strategic bomber may not have proved the decisive influence on the campaign that it was originally expected to be, and the tactical air forces may not have been able to prevent defeat being perilously near at times, but this does not mean that such forces are not required. Even in Korea the Allied air supremacy may yet be the decisive factor, although there have been signs that this supremacy may be challenged, as there were reports at the end of April, 1951, of a big build up of aircraft on airfields north of the Yalu River.

The American F.80 (Shooting Star) and F.86 (Sabre) fighters have hitherto had it all their own way in combat with the Mig-15 fighters, but five B.29 bombers had been shot down up to the beginning of May. The balance remains, however, almost entirely in favour of the Americans, who claimed to have destroyed or damaged 275 enemy aircraft (151 on airfields and the remainder in the air) from the commencement of the war to early April, and to have suffered only negligible losses themselves through enemy action.

Another noticeable feature of the air war has been that so far the enemy air force has been used purely defensively, and that all their losses have been over their own lines. No air force can exercise a decisive influence on a campaign unless it can pursue an offensive policy, and thus wear down

the air strength of the enemy, as was first exemplified by the air offensive of the old Royal Flying Corps under the command of Lord Trenchard during the 1914-18 war.

Various lessons regarding the use of air forces can be learnt from Korea, but the main lesson which seems to emerge is that it is little use pinning one's faith to any one arm or means for success in war. The strategic bomber, using the atom bomb or its successor the hydrogen bomb, may well prove decisive in a major war. At least, as Mr. Churchill said of the bomber offensive in the dark days of 1940, there is no harm in trying it, but, as in Korea, the strategic bomber may not prove decisive and air superiority may have to be fought for, as it had to be in 1939 to 1945. At the same time tactical air support will be essential in any conflict with an army organised on modern lines, and all these various facets of air power must be continuously developed and improved.

The foot soldier may be pre-eminent on the field of battle, but he is not going to win a war unaided. The main strength of the countries of the West lies in their industrial capacity rather than in manpower. Their forces must be so organised as to take the fullest advantage of their superiority in this respect, in order to compensate for their lack of manpower compared with Russia and her satellites, and we must not be led away by Korea into thinking that the answer lies in masses of foot soldiers any more than in any other arm.

This point was well made by General MacArthur during his examination when he was asked his opinion on the view that the United States should confine the bulk of her forces to the American continent, and should provide other nations with sea and air support only in their battle against Communism. The General replied: "I believe that it is the gravest possible mistake in the use of the armed forces of a nation to try to draw the lines of demarcation between ground toops, air troops, and navy troops. They are an integrated team. At one place you may need the preponderance of one element or another, but the force that we apply should be based upon the complete integration of the potential of those three forces. It is impossible to make such a simplification, in my opinion."

Korea has certainly provided proof of the soundness of the General's views on this issue. The war in Korea should help to drive home the lesson that it is essential to have balanced forces of all arms, organised on flexible lines designed as far as possible to meet all likely contingencies, in the certain knowledge that no two wars are alike, and that there is no ready-made solution to be found in advance.

W. M. YOOL

REFERENCE SECTION

DEFENCE PROGRAMME

(Cmd. 8146)

STATEMENT MADE BY THE PRIME MINISTER IN THE HOUSE
OF COMMONS ON MONDAY, JANUARY 29, 1951

1. At the Brussels meeting of the North Atlantic Council on December 19, my right hon. Friend the Foreign Secretary said that, in view of the urgent need to strengthen the defences of the free world, His Majesty's Government had decided to increase and accelerate their defence preparations still further and were considering what form and direction that increased effort should take. I am now in a position to give the House a broad indication of the scale of the new defence programme which the Government have adopted.

2. I wish at the outset to reaffirm the purposes which this programme is designed to serve and support. The Government do not believe that war is inevitable. Their purpose is to prevent war. But they believe that peace cannot be ensured unless the defences of the free world are made sufficiently strong to deter aggression. It is for this purpose, and for this purpose only, that the Government now think it right to take still further measures to increase the state of preparedness of the Armed Forces.

MANPOWER

3. As a result of earlier measures the numbers in the active Forces have already been substantially increased. The total strength of the Armed Forces will, by April 1 next, reach 800,000 men—as compared with the figure of 682,000 given in the last White Paper on Defence. We are, however, without the trained reserves of officers and men with up-to-date training who would be required to fill out the existing formations in an emergency. As this House knows, the Government's long-term plan has been to build up these reserves through the system of National Service; but there has not yet been time to build them up from National Servicemen who have finished their Colour service. The Government now propose to fill this gap by calling on a number of selected Reservists who have the up-to-date training required, and giving them a period of refresher training so that, if an emergency arose requiring general mobilization, they would be ready to take their place in the units with which they would have to serve.

4. We have therefore decided to call up this summer for fifteen days' training with the Army up to 235,000 reservists, officers and men. The great majority of the men will be Class "Z" Reservists, who were called up for service before the end of 1948.

Of these some 80,000 will do their training in the Territorial units and formations with which they would actually serve if war broke out.

Forty thousand Reservists will be similarly called up for training in the Anti-Aircraft Command.

About 115,000 Reservists will be called up for training with Active Army formations in the United Kingdom and with various technical, administrative, and fighting units which would be required in war to support our Forces overseas and in this country.

In addition, the Royal Air Force will recall for fifteen days' training about 10,000 officers and men who will be required to man the Control and Reporting Organisation in emergency. The men will be drawn from the Class "G" Reservists, which are the equivalent of the Army Class "Z."

5. The Class "Z" and "G" Reservists to whom I have referred, being specially selected trained men required to serve exceptionally in peacetime, will receive the normal Regular rates of pay and allowances, together with a bounty of £4. By arrangement with the Ministry of Labour, no Class "Z" or "G" Reservists will be recalled who would be reserved for industry in the event of general mobilisation.

6. Legislation will be introduced in the near future to give effect to these proposals. The men to be called up will be notified as early as possible, and each man will be given the maximum notice of the date on which he is to join his unit. Arrangements will be made to give sympathetic hearing to cases of individual hardship. The legislation to which I have referred will confer on these men the same protection against loss of employment or holidays on account of their training as is enjoyed by National Servicemen summoned for training during their part-time service.

7. This is a selective call-up. The purpose of the plan is to select those officers and men whose qualifications and experience in their rank, trades or arm of the Service fit them to fill the existing gaps in the formations and units as they now stand. The selection must therefore involve some element of discrimination between man and man; for, if the plan is to achieve its purpose, the basis of selection must be the actual requirements of the Services. The officers and men selected will in fact be those who, by virtue of their qualities and experience, can best fulfil the country's need at this time.

8. We shall also call on some members of the Regular Reserve and Auxiliary Forces to make their contribution.

The Royal Navy will call up about 6,000 men from the Royal Fleet Reserve for eighteen months' service with the Regular Forces.

The Navy will also need, for eighteen months, about 600 officers from the emergency list of the Royal Navy, the R.N.V.R., or the R.N.V.S.R. It is hoped that a good proportion of the Reservists concerned will be obtained by calling for volunteers.

The fighter squadrons of the Royal Auxiliary Air Force are an essential part of the fighter defence of this country. The officers and men of these squadrons, numbering about 2,300, will be called up for three months' continuous training, which will enable them to take their place in the front line in the event of emergency.

The Royal Air Force will also recall for three months' refresher training about 1,000 aircrew Reservists of the Regular and Volunteer Reserves. In addition, about 200 Regular and volunteer Reservists may be recalled for flying instruction duties for periods up to eighteen months. It is hoped that a good proportion of these will be obtained by calling for volunteers.

9. For the time being it will be necessary to continue the practice which, as the House knows, all three Services found it necessary to adopt at the beginning of the fighting in Korea, of retaining Regulars beyond the normal expiry of their Colour service. But the additional period which individuals so retained will be required to serve, after the expiry of their Colour engagement, will not exceed eighteen months in the Royal Navy, between twelve and eighteen months in the Army, and twelve months in the Royal Air Force. The Regular Reservists already called up by the Navy and Army for the Korean emergency will be released by those two Services after they have completed a broadly similar period of service.

10. The general purpose of all these plans is to make more effective the Regular Forces now in being, and to ensure that mobilisation, if it became necessary, could be carried out more rapidly and smoothly than would otherwise be possible. This applies particularly to the provision of the units and formations which would be required in the initial stages of an emergency. For the Navy, the measures proposed will enable more ships to be put into full commission, and will enhance the state of readiness of the Reserve Fleet. They will enable the Active Army to move more rapidly to a war footing in an emergency, and they will facilitate the rapid mobilisation of certain formations and units of the Territorial Army. For the Air Force, they will enable additional squadrons to be formed more quickly, will greatly improve the over-all efficiency and readiness of our air defences and will provide for the additional training requirements both of the front line units and of the Reserves.

PRODUCTION

11. I now turn to production. As regards equipment, the Forces have for the last five years lived largely on their stocks; and there is now urgent need of an increased production programme concentrated mainly on increasing their fighting strength. We intend to carry out this production programme to the limit of the resources under our control. The completion of the programme in full and in time is dependent upon an adequate supply of materials, components and machine tools. In particular, our plans for expanding capacity depend entirely upon the early provision of machine tools, many of which can only be obtained from abroad.

The effort we are making is an integral part of North Atlantic defence, the success of which will depend upon our defence preparations which in their turn will depend on the mutual availability of machine tools and raw materials.

12. If our plan is fully achieved, expenditure on production for the Services in 1951-52 will be more than double the rate for the current year; and by 1953-54 it should be more than four times as great. By then we should have quadrupled our annual output of tanks and combat aircraft. We shall introduce new types of equipment as rapidly as possible. New types of fighter aircraft will come into service in larger numbers. Production of the twin-engined Canberra bomber will be increased, and the first order is being placed for a four-engined jet bomber. Combat vehicles of new design will be introduced, and there will be notable improvements in the supply of new types of anti-tank and anti-aircraft weapons and equipment. The programme for building and converting ships to deal

with the submarine and mining threats will be greatly accelerated. We shall also see that the Services have the stores, clothing, and equipment required to enable them to be ready for operations immediately upon mobilisation.

13. We also intend to accelerate as far as we can the measures we already have in hand for accumulating stocks of food and raw materials, as an insurance against interruption of imports in war. The limiting factor is not money but availability of supplies, particularly as regards raw materials. It will be our policy to make full use of the Commodity Group machinery that is being set up following my visit to Washington.

CIVIL DEFENCE

14. This defence programme is designed to deter aggression, and we have therefore placed the emphasis upon the strengthening of the active defences. There must be limits to the resources which can be applied to defence purposes in time of peace, and we do not propose any general acceleration of civil defence preparations. We shall, however, press on with civil defence planning; and we shall accelerate those civil defence measures which directly support the efficiency of the Armed Forces—in particular, communications, the control network and the warning system. In addition, we shall begin to build up stocks of some of the essential equipment required by the civil defences services, including the Fire Service, and the Hospitals and Emergency Medical Services.

TOTAL COST

15. Over the whole field of military and civil preparations for defence, apart from the stockpiling programme, expenditure in the financial year 1951–52 will be in the neighbourhood of £1,300 millions. It will take time to build up defence production to the levels which we now have in mind, and expenditure on production will be on a rising curve during the next three years. If the programme is fully achieved, the total defence budget over the next three years, covering all the military and civil preparations but again excluding stockpiling, may be as much as £4,700 millions. Nearly half of this will be for production. I should once more call attention to the limitations on production which I mentioned earlier and to the fact that these limitations may make it impossible to spend this sum within that period.

ADMINISTRATION

16. This acceleration of defence preparations will involve an increased call on our already strained resources of experienced staff, administrative, technical and other. This requirement cannot be met without a diversion of effort from peace-time activities, and my colleagues will consider to what extent they can discontinue or retard peace-time activities of their Departments in order to free staff for defence work. It may also be necessary for local authorities to make a similar diversion of effort to defence planning.

ECONOMIC IMPLICATIONS

17. I will conclude by giving a broad indication of the effect of this programme on our economy. This heavy and growing burden comes at a time when we already need a further large increase in exports to meet our rapidly rising bill for imports. In meeting this situation the Government have one clear aim before them ; to see that we carry as much of the load as possible ourselves, now, and refrain from mortgaging the future by running into debt abroad or reducing the investment on which our industrial efficiency depends. This will be a task of great difficulty because the industries which will have to carry most of the increased defence orders, the engineering and metal-using industries, are the very ones on which we have relied to make the biggest contribution to exports and to industrial equipment.

18. This means that the measures we must now take will be far-reaching and will affect every citizen and almost every industry. There will have to be financial measures to check civilian demand. On these I will say nothing ; the Chancellor of the Exchequer has them under consideration and will inform the House when he opens his Budget. But, in addition, there will have to be a series of more direct economic measures. Within the compass of this statement I can give only a broad outline of these, but it will be elaborated by Government spokesmen in the coming debate.

19. Our task is to turn over progressively to defence production sections of the engineering industry, especially those producing aircraft, vehicles, radio and radar equipment, and machine tools. Some new factories will have to be built : and authority has already been given for two additional tank factories and for several new production lines for the most modern types of jet engine. But for the most part we must rely on existing capacity. Much of the new work under this increased defence programme must replace work that is already going on. This will inevitably reduce the exports of these industries, particularly now when labour and materials are so scarce. We must therefore call on the rest of industry in two ways. When the main contracts have been placed, those sections of the engineering industries which are now producing goods for current consumption will be called upon to take some of the strain of producing components and so on under sub-contracts. Secondly, these and other industries, such as the textile industry, will have to expand their exports still further. In this way we aim to maintain a balance in our overseas accounts, at the expense primarily of home consumption, although some reduction in the supply of plant and machinery will be inevitable. There must also be some reduction in the civil building programme, though we shall do our utmost to avoid large or widespread interference with it.

20. To achieve all this we shall have to reimpose many of the controls used during the war. Allocations of some raw materials have already been introduced ; others will probably be necessary, to ensure that defence needs are met. Some less essential production, especially for the home market, will have to be reduced or stopped, by limitation of supply orders and the prohibition of certain end-uses. Factory and storage space will be requisitioned where necessary. If, as the programme develops, it appears that exceptional measures are necessary to ensure the availability of labour, we shall not hesitate to take them.

21. The fulfilment of defence orders must be regarded as of special importance, and carried through with all possible urgency. Some firms, for their own protection, will have to be given directions about the volume of defence orders which they must accept, and the timing of these in relation to other orders. In other cases, where a firm is doubtful whether a defence order should have preference over other obviously important orders, such as equipment for a generating plant or an export of special importance, the firm should immediately consult the Supply Department concerned, which will arrange for the necessary guidance to be given. In this way we shall ensure that the defence programme is carried through without introducing the idea of "an overriding priority" for defence which, as all our experience in the last war showed, creates more problems than it solves and produces bottlenecks which very soon interfere with the whole production machine.

22. This programme will have far-reaching effects on the pattern of industry. To carry it through effectively and smoothly, the Government will need the fullest support and co-operation from managements and men. They are confident that this will be forthcoming. Both sides of industry will be taken fully into consultation at every stage of the programme.

23. As I have said on a number of occasions—and, indeed, as has been said by President Truman—a sound and robust economy is an essential condition for the preservation of free institutions. It is also an essential support for military strength; and, in preparing this programme, the Government have weighed very carefully its probable effect on the social and economic standards of life in this country. I make no attempt to deny that it must affect our standard of living: we shall all have to make some sacrifices in the face of rising prices and shortages of consumer goods. But, though the burden will be heavy, it is not more than we can bear. If we carry it in the way I have suggested, we shall not destroy the recovery which we have made in the last few years; nor shall we imperil the future strength of our economy. I trust that, despite the difficulties, the great productive efforts which have made that recovery possible will be maintained, and I am confident that all sections of the community will give their full support to this national effort to make ourselves strong enough to deter any attack upon our freedom and our way of life.

THE NAVY ESTIMATES 1951-52
FIRST LORD'S STATEMENT
(Cmd. 8160)

INTRODUCTION

THE ESTIMATES which I present for 1951-52 provide for a net expenditure of £278,500,000. It will be appreciated that it has not been possible for me to make detailed provision in these estimates for the further measures to speed up the preparedness of the Royal Navy which were announced by the Prime Minister on January 29, 1951. The House of Commons will be approached in due course for a supplementary grant.

The net provision for which I am immediately seeking approval represents an increase of £85,500,000 on the original net Estimates for the current year, or £75,500,000 if allowance is made for the Supplementary Estimate which was presented on January 23, 1951. The increase is principally due to the measures already taken to improve the preparedness of the Navy, as announced to Parliament on July 26 and September 12, 1950; additional provision is also needed to cover the improvement in Service emoluments, for increased prices, and for the continuation of special measures in the Far East.

Vote A in the Estimates now published provides for a maximum strength of 143,500, which includes 5,085 for the Women's Royal Naval Service and 230 for the Queen Alexandra's Royal Naval Nursing Service. It also includes officers and men who are retained beyond the period of their engagement to meet the Korean emergency, and the reservists who have been recalled for that purpose. The figure also includes men and women on terminal leave—not expected to exceed 1,700 at any time during the year—and also 3,500 ratings entered for local service on Foreign Stations.

The recently decided additional measures, to which I refer above, are expected during the forthcoming financial year to increase the strength of Vote A to a maximum of 152,000 bringing the total demand on United Kingdom manpower to 149,000. This will be attained by the recall of 6,600 additional reservists and by the retention of men beyond the period of their normal engagements, each of whom will be required for 18 months' service. By this means, a substantial number of ships will be added to the active Fleet, some by being brought forward from reserve and some from completion of new vessels.

The original New Construction Programme for 1950-51 has, during the year, been amplified by the addition of a number of vessels mainly for escort and minesweeping duties, provision for which is included in the Supplementary Estimate which I have already presented. It is proposed, during the forthcoming year, to undertake a wider programme of new construction, mainly of these types, but including also a number of Coastal Craft and miscellaneous vessels. Further information will be found on pages 414-16. The total provision for production and research, which I am proposing in the present Estimates, is approximately £132,000,000 net,

as compared with nearly £73,000,000 net in the original Estimates for the current year. As in previous years, allowance has been made for possible under-spending on contract work, etc.

HALL

SOME NOTES ON NAVAL ACTIVITIES AND ADMIRALTY POLICY

THE FAR EAST

In July 1950, owing to the Korean situation, it was necessary to withdraw His Majesty's Ships from the Yangtse patrol. This patrol had been established to protect British merchant ships engaged in trade with Shanghai from interference by Chinese Nationalist warships who were endeavouring to enforce the closure of certain ports on the mainland of China.

There have been a number of instances of merchant ships and Naval vessels, proceeding along the normal routes to and from Hong Kong and through waters adjacent to Hong Kong, being fired on by Chinese forces of the Central People's Government from shore batteries on the many islands near Hong Kong.

No intimation has been received from the Central People's Government of their intention to deny the right of innocent passage in the waters in question, but there have been Press reports of orders issued by the Chairman of the Kwangtung Provincial Government to troops under his command to open fire on foreign ships entering Chinese territorial waters without prior permission. His Majesty's Government has received no reply to two Notes of protest addressed to the Central People's Government about these incidents.

His Majesty's Ships have given all possible assistance and in order to avoid, as far as possible, further incidents, merchant ships are being advised to avoid islands held by the Central People's Government. This advice does not, of course, in any way imply that shipping proceeding to and from Hong Kong should not enjoy absolute freedom on the high seas and the right of innocent passage.

The following units of the Royal Navy have taken part in the United Nations operations in Korea in support of the Security Council's Resolutions:

- 4 Cruisers
- 2 Aircraft Carriers
- 7 Destroyers
- 7 Frigates
- 1 Aircraft Maintenance Carrier
- 2 Headquarters Ships

and a number of supporting vessels, including the Hospital Ship Maine.

Under the command of the United States Commander of the Naval Forces in the Far East, these ships, and in particular the Aircraft Carriers—together with a number of ships from Commonwealth countries—have played a distinguished and prominent part, right from the outset of hostilities in Korea—a part to which the United States authorities have paid generous testimony.

The 41st Independent Commando, R.M., was despatched from the

United Kingdom in September of last year, and on its arrival in Korea was joined by several Naval and Marine volunteers from the Far East Fleet. This Commando Unit, which subsequently joined the First Marine Division of the United States Marine Corps, has carried out many successful operations, including three raids from United States ships on enemy railway communications. Details of the operations were described in answer to a Parliamentary Question on December 13, 1950.

In June 1950 the 3rd Commando Brigade was sent at short notice from Hong Kong to Malaya, and was given the responsibility for the maintenance of law and order in the State of Perak.

STRENGTH OF THE FLEET

The table below shows the strength of the Fleet in classes (excluding vessels of the Fleet Train, attendant ships and numerous small craft):

	Active Fleet	Training and experimental (special complements)	In Reserve or reducing to reserve (not including ships for disposal)	In course of construction*
Battleships	—	Vanguard	Anson Howe Duke of York King George V Victorious (a) Implacable Formidable	—
Fleet Carriers ..	Indomitable	Indefatigable Illustrious (b)	—	2
Light Fleet Carriers	Theseus Glory Vengeance Ocean (b)	Triumph (b) Warrior	—	7 (e)
Escort Carriers ..	—	—	Campania (c)	—
Cruisers	13	2	11	3
Destroyers	28	18	65 (d)	8
Frigates	36	13	113	4
Monitors	—	—	2	—
Submarines	32	—	24	—
Minesweepers ..	13	3	47	41
Fast Minelayers ..	—	—	3	—

* Work on some ships temporarily suspended (for details see Navy Estimates, 1951–52, pages 249–250).

(a) Modernizing.

(b) Refitting.

(c) Lent to the Festival of Britain for about two years.

(d) Excludes one being transferred to Royal Pakistan Navy on March 6, 1951.

(e) Excludes one for transfer to the Royal Australian Navy.

TRANSFER OF HIS MAJESTY'S SHIPS TO COMMONWEALTH AND OTHER NAVIES

There have been no transfers of ships to Commonwealth Navies during the financial year 1950–51, but one destroyer will shortly be sold to Pakistan. The sale of a destroyer to South Africa was completed in March 1950.

The following ships have been sold to foreign countries during the year:

One Frigate to Egypt,
One Minesweeper to Portugal,
Twelve Landing Craft (Assault) to the Netherlands.

The third and fourth Algerine Minesweepers to be acquired by Belgium

are expected to be transferred shortly. In addition, arrangements are expected to be completed shortly for the charter of a Boom Defence Vessel to Egypt.

CO-OPERATION WITH COMMONWEALTH AND ALLIED NAVIES

During the year 1950–51 two Frigates of the Royal New Zealand Navy exchanged stations with two Frigates of the Mediterranean Fleet for about six months. During this period the exchanged ships were under the control of the commander-in-chief of the Fleet to which they were attached, resulting in a complete exchange of knowledge of operational techniques, etc. In addition the Aircraft Carrier H.M.C.S. Magnificent with two Canadian Destroyers and the Aircraft Carrier H.M.A.S. Sydney took part in joint anti-submarine exercises with ships of the Royal Navy at Londonderry. Subsequently the Canadian ships joined the Home Fleet for exercises at Gibraltar. Ships of the Indian and Royal Pakistan Navies have also taken part in exercises with ships of the Royal Navy.

The Royal Ceylon Navy came into being on December 9, 1950, and absorbed the Ceylon R.N.V.R. An officer of the Royal Navy, who had been Naval Adviser to the Ceylon Government, has been appointed in command.

EXERCISES WITH ALLIES

Joint exercises with Navies of Western Union and North Atlantic Treaty countries have been restricted in the main to small-scale exercises, from which it is considered that more immediate benefit is derived than from large-scale exercises such as Exercise "Verity," which was carried out during the previous year. One of the most interesting exercises was a Chart Exercise held at Malta to consider Mediterranean strategic problems, in which Fleet Commanders-in-Chief representing France, Italy, the United States, and Great Britain participated.

NEW CONSTRUCTION, CONVERSION, AND REPAIRS GENERAL

New construction, modernisation, and conversion have been greatly accelerated in keeping with the £3,600,000,000 Defence Programme on which these estimates are based, and will be further accelerated under the additional programme recently announced by the Prime Minister.

The whole programme is largely directed towards the under-water menace. We aim to provide the majority of ships for the anti-submarine purpose by conversions of fast destroyers and for minesweeping by new construction.

The work of modernisation and conversion is being pressed on, not only to the full capacity of the Royal Dockyards, but also in the private yards which will undertake a number of the conversions and almost all the new construction in the next financial year.

NEW CONSTRUCTION

Of the two Fleet Aircraft Carriers under construction, H.M.S. Eagle is expected to join the Fleet shortly while the construction of Ark Royal is being adjusted to allow even later equipment to be embodied in her than is fitted in Eagle. Work is also proceeding satisfactorily on the four Light

Fleet Carriers of the 'Hermes' Class and the eight Destroyers of the 'Daring' Class, and their completion will be hastened so far as the supply of equipment permits.

A number of new designed A/S Frigates are to be built. The governing factor in this programme is the provision of machinery, but within this limitation as many as possible will be laid down next financial year. All these vessels will be fitted with the very latest developments in anti-submarine weapons, which will make them unequalled in their anti-submarine role.

A number of A/S Frigates of a simpler design are also to be built. Although they will lack some of the refinements, they will be highly effective in the anti-submarine role. The machinery for the first two of these ships has already been ordered and the hulls will be laid down shortly.

Work on two prototype Frigates for other special duties has already begun in the Royal Yards.

The majority of orders for 41 new minesweepers—of entirely new designs—have already been placed. This programme will be substantially increased by the accelerated defence plan.

A programme of Fast Patrol Boats for use either as torpedo boats or gun boats is in hand. The first two, which incorporate experimental features, will soon be finished. A further programme of Fast Patrol Boats will be superimposed upon the present one under the additional programme recently announced.

Satisfactory progress has been made on the development of fast submarines of a new type.

The construction of two prototypes of a new class of vessel for seaward defence will now be augmented by other ships of the class during the year.

It is intended to commence construction of a new Hospital Ship of about 10,000 tons.

MODERNISATION, CONVERSION, AND REPAIR

H.M.S. Victorious is undergoing extensive modernisation at Portsmouth.

The plan for the re-equipment of our Cruiser force is well under way and H.M. Ships Birmingham, Newcastle, and Newfoundland are now in hand at the Royal Yards. The first phase of the conversion of the Trials Cruiser Cumberland is almost complete. The trials of advanced models of new equipment which are to be carried out in this ship form a vital part of the programme for the re-equipment of the Fleet.

The conversion of Fleet Destroyers into fast A/S Frigates is being pressed forward with all speed. The first two—Rocket and Relentless—are nearing completion, another four have been started and the programme will expand progressively during 1951–52. These vessels will be capable of dealing with any submarines which a potential enemy is likely to be able to put to sea for many years, and they represent the quickest and most effective means by which our ocean-going A/S forces can be built up.

At the same time the programme is being supplemented by a simpler form of conversion which—without the refinements—will give us fast ships with good A/S qualities more rapidly than would a further programme of full conversion of the Rocket/Relentless kind. H.M.S. Tenacious, now in hand, is the first of these.

Improvements will be made to the A/S equipment of existing destroyers and frigates.

Work is in hand to improve the performance of our existing Submarine Fleet and in certain ships a marked increase in submerged speed will be obtained.

Energetic measures have been taken to ensure that the ships of the Reserve Fleet are at their proper notice for emergency, and since the war some 450 refits of these ships have been carried out, leaving a comparatively small number to be dealt with during 1951-52.

STANDARDISATION

Progress in standardisation of material within the Navy is continuing satisfactorily. Discussions on standardisation with the United States and Royal Canadian Navies are proceeding over the whole field of Naval warfare following agreement reached at a meeting of representatives of all three Navies in Washington last year.

Progress has, in fact, already been made in the use of similar techniques and tactics, so that ships of all three Navies can operate together with maximum efficiency. Common methods of communication are now used, and the aircraft of the three Navies employ a common technique for landing on the decks of aircraft carriers.

Within the Royal Navy some economies are being affected by reducing, wherever practicable, the great variety of similar stores in use.

CLOSING OF THE ROYAL DOCKYARD AT BERMUDA

The Parliamentary and Financial Secretary to the Admiralty informed the House of Commons last year that the Royal Dockyard at Bermuda had become uneconomical to maintain and that it had been decided to close it.

Recreational facilities for ships' companies are, however, being retained and Bermuda will also remain the Headquarters of the America and West Indies Squadron, thus preserving the traditional association of the Royal Navy with Bermuda. The closure of the rest of the Dockyard has steadily progressed during the past year.

The Government of Bermuda have throughout shown a ready appreciation of our problems, and the Royal Navy are greatly indebted to them for their co-operation and assistance.

STORES AND EQUIPMENT

Steps were taken during 1950-51 to start building up the reserves of stores of all kinds which would be required to enable the Fleet to be placed on a war footing if an emergency arose. Stocks had been run down to relatively low levels during the post-war years in the interests of economy and of surrendering goods in short supply to the civilian market. The process of rebuilding these stocks will continue, and by the end of the coming financial year a substantial proportion of reserve requirements will have been accumulated. The stores concerned include clothing and other victualling stores, medical stores, ammunition, engineering spare parts, general Naval maintenance stores, and oil fuel.

Stocks of degaussing and other equipment for the protection of the Merchant Fleet in war are also being built up.

NAVAL AVIATION

Since July last, Naval aircraft have been engaged in the hostilities in Korea in support of the United Nations Naval and land forces. Operating from H.M.S. Triumph and H.M.S. Theseus they have attacked a wide variety of targets, including airfields, communications, troop concentrations, and shipping; carried out anti-submarine patrols and air-sea rescues; given fighter cover and acted as "spotter" aircraft during bombardments. H.M.S. Unicorn, an aircraft maintenance ship, has given close support, and the Naval Air Station at Sembawang, Singapore, which was commissioned early in 1950, as a precautionary measure, in view of unsettled conditions in the Far East, has proved of great value.

During the past year the first steps have been taken in plans for expanding the Front line and Training strengths of Naval aircraft. The re-equipment of Carrier Air Groups with modern types of aircraft, including jets, is being advanced as rapidly as possible. Preparations are in hand at certain Naval Air Stations to facilitate the operation of jet aircraft, when shore-based, by the extension of runways and the provision of larger oil fuel storage tanks. Progress is being made with the modernisation of radio equipment at Naval Air Stations.

Close attention continues to be paid to the development and evaluation of air-borne anti-submarine equipment, and an air group has recently been formed to specialise in night flying. Naval aircraft again joined the Army and the Royal Air Force in combined exercises in Germany.

Steps are being taken to put into production a new general reconnaissance aircraft for anti-submarine work. During the forthcoming year trials of helicopters will continue to be carried out in order to assess their operational potentialities. Helicopters will be coming into service in the Fleet for search and rescue duties.

One of the R.N.V.R. Air Squadrons carried out exercises with the Mediterranean Fleet, and a composite squadron, derived from the other three R.N.V.R. squadrons, embarked for a short time in carriers of the Home Fleet for operational training.

RESEARCH AND DEVELOPMENT

There has been no notable change in the policy which governs the Admiralty research and development programmes since the Navy Estimates were last presented. The scientific effort continues, for the greater part, to be directed to counter-measures against the various forms of high-speed attack which may be expected in the future. These include attacks by high-speed jet aircraft, by high-speed missiles, and by submarines with underwater speed, submerged endurance and capacity for deep diving greater than anything encountered in the past. All possible steps are, therefore, being taken to improve the capacities of existing weapons and, in many cases, to develop completely new ones.

To meet the air threat radar equipment is being developed, among other things, to give increased range and speed of warning, as well as predictors of higher performance, and improved A.A. guns of higher rate of fire using proximity fuzed ammunition. In addition, new fighter and anti-submarine aircraft of high performance are being developed for the Navy.

To counter underwater attack, weapons with greater range and striking power than have been available in the past are being developed, together

with improved detection and location equipment to enable these weapons to be used effectively.

The Admiralty's efforts to produce propulsive and auxiliary machinery of greater efficiency and smaller weight and volume are being continued and have met with a large measure of success. Considerable effort is being devoted to propulsive equipment for the fast submarine. A programme of investigation into the development of nuclear propulsion is in hand.

Continued attention is being given to questions of safety and habitability. Submarine escape and rescue, survival conditions at sea in low temperatures and protection from harmful radiation released by atomic weapons are among the more important problems of this kind being tackled.

The tendency for research and development expenditure to increase, which was forecast last year, is reflected in an estimate, the overall amount of which is approximately 30 per cent. above that included in the estimates for 1950-51. This increase is due not only to the fact that many projects are coming to fruition in the form of expensive prototypes, but also to the accelerated rearmament programme, and to rising industrial costs.

In all research and development activities close touch with the Commonwealth countries and with our Allies is being maintained. Every effort is being made to ensure that our combined resources are used with maximum efficiency and economy.

MEDICAL RESEARCH

During the past year the R.N. Medical Service has taken part in research covering a wide range. The Navy now uses equipment of great complexity, and it is realised that the man and his machine must be considered as a single unit. The fighting efficiency of the Fleet can reach its peak only if equipment is designed with the physiological and psychological limits of the operator kept clearly in mind. Furthermore, a properly controlled environment must be provided for him to work in.

At the Tropical Research Unit, Singapore, studies are being made of the tropical climate and its effects on living conditions and working efficiency. Under the guidance of the Medical Research Council work on equipment design and the psychology of equipment operation is being pursued in the Universities of Oxford and Cambridge.

The prospects of shipwrecked men have been much improved by recent researches into survival equipment and rations. At the R.N. Physiological Laboratory new knowledge is being gained in the domain of submarine and diving medicine and very valuable work has been done on the effects of underwater explosions.

In all these projects Naval Medical Officers are playing an active part. The experience which these Officers are gaining of research methods will ultimately be of considerable value to the Service. The Medical Department also keeps in close touch with research which will help to protect the Fleet against atomic, chemical, and biological warfare.

WORKS PROGRAMME FOR 1951-52

Provision has been made for progressing the construction of married quarters and the modernisation of the Royal Naval and Royal Marine Barracks. Measures to improve living conditions at certain Royal Naval Air Stations will also be put in hand.

More storage will be constructed, and works undertaken to improve W/T and Radar communications. Improvements to working conditions and workshops in the Dockyards will be continued.

As a result of the further Defence measures recently decided upon, provision will be made for bringing additional Royal Naval Air Stations into service, and for the further acceleration of the programme of reconstructing runways at existing Royal Naval Air Stations to meet the needs of modern aircraft. Additional base facilities will be constructed and works undertaken to improve seaward defences. More storage will be acquired.

NAVAL PERSONNEL

STRENGTHS

OFFICERS

The reinforcement of the Far East Fleet to meet the Korean emergency made it necessary to make a small increase in the number of experienced officers by retaining some on active service who were due to leave, and to recall certain Reserve officers. As part of the further measures to increase the preparedness of the Fleet the retention of officers beyond their normal period of service will continue, and it is proposed to call up an additional 600 officers for 18 months from either the Emergency List, the R.N.V.R., or the R.N.V.S.R. It is anticipated that a good proportion of this number will be volunteers.

The shortage of officers for aircrew is a matter of serious concern to the Admiralty and it cannot be too widely known that a substantial number of young men of good education and physique are required to fly in the Royal Navy. Considerable increases in basic pay, flying pay, and gratuity are resulting in an improvement in recruiting, but more candidates of the right type will need to be forthcoming for some time if Naval Aviation is to be adequately manned. As a partial remedy for the present shortage a number of experienced ex-Naval pilots are being entered for special commissions of from four to six years.

RATINGS

The Navy is still short of senior and experienced ratings, especially at the Petty Officer level. By retaining ratings beyond their terms of engagement and recalling Reservists the Navy has been able to meet the additional manning commitments of reinforcing the Far East Fleet. The process of retaining men as their engagements expire for 18 months will continue during the forthcoming year. As already announced up to 6,000 additional Royal Fleet Reservists will be called up for a period of 18 months during the next financial year.

RE-ENGAGEMENTS

Among the measures taken to encourage men to re-engage to complete time for pension has been the introduction of a £100 bounty.

RECRUITMENT OF REGULARS

The intake of new recruits has been slightly increased, but the present needs cannot be remedied by large entries of young inexperienced men.

On the whole the number of new recruits the Navy needs have been obtained, but there are deficiencies in certain Branches.

NATIONAL SERVICE

The entry of National Service men to the Navy in the forthcoming year is expected to be in the neighbourhood of 2,500. Because some of the larger entry in 1949 reach the end of their two years service, the total of National Service men in the Navy will drop during the year by some 3,000.

RESERVES

Retention of time-expired men in the Service is necessarily affecting recruiting to the Royal Fleet Reserve, but it is nevertheless hoped to reach a strength of 25,000 during the financial year.

Recruiting for the Royal Naval Reserve has been less satisfactory than was anticipated during 1950-51, and provision has therefore been made for a rather smaller maximum strength of approximately 4,500 officers and men. During the year recruiting for the Royal Naval Volunteer Reserve and the Royal Marine Forces Volunteer Reserve has proceeded steadily, and provision is made in the estimates for a maximum strength of 11,000 and 1,500 respectively for these reserves.

A Women's Royal Naval Volunteer Reserve, organised on similar lines to the Royal Naval Volunteer Reserve, will be instituted during 1951-52.

Voluntary refresher training has recently been offered to certain members of the Royal Naval Volunteer Supplementary Reserve and the Women's Royal Naval Reserve, both of which have no training liability, and provision has been made for the continuation and extension of such voluntary training in 1951-52.

The Royal Naval Special Reserve, in which National Service men who do not join the voluntary reserve are entered for their part-time service, will commence their training in January 1952. It is expected this reserve will reach a bearing of approximately 8,000 during 1951-52.

ADMINISTRATION OF JUSTICE IN THE ROYAL NAVY

The Committee established in February 1949 under the chairmanship of Mr. Justice Pilcher to consider the administration of justice under the Naval Discipline Act presented in February 1950 its First Report on the naval court-martial system. This was followed in November 1950 by a Second Report dealing in the main with the administration of summary justice in the Navy. Both reports have since been published (Command 8094 and Command 8119). The recommendations in these reports have been carefully studied and collated with the recommendations in the earlier report of Mr. Justice Lewis's Committee on the administration of justice in the Army and the Royal Air Force (Command 7608).

The conclusions of His Majesty's Government on most of the recommendations in these reports are contained in "Courts-Martial Procedure and Administration of Justice in the Armed Forces" (Command 8141). The latter document shows that a large number of Mr. Justice Pilcher's Committee's recommendations have been accepted by the Admiralty and are being put into effect. For this purpose it will be necessary to amend the Naval Discipline Act and the necessary legislation will be introduced

as soon as may be practicable. Legislation has already been introduced to establish a Court-Martial Appeal Court to which persons convicted by court-martial may be able to appeal against their conviction.

ADMIRALTY OFFICE

The number of staff at Admiralty Headquarters on January 1, 1951, was 10,575, or 405 (i.e. 3·9 per cent.) less than on January 1, 1950. The Government's rearmament programme will inevitably involve increased demands for staff and the numbers employed at Headquarters are expected to rise during the coming year.

The Deputy Secretary of the Admiralty, R. R. Powell, Esq., C.B., C.M.G., was transferred to the Ministry of Defence in October 1950. He has been succeeded by C. G. Jarrett, Esq., C.B., C.B.E.

Sir Frederick Brundrett, K.B.E., C.B., Chief of the Royal Naval Scientific Service, was transferred to the Ministry of Defence on July 1, 1950, and has been succeeded by W. R. J. Cook, Esq., C.B., M.Sc.

EVENTS OF NAVAL INTEREST DURING THE YEAR

THE FIRST SEA LORD'S TOUR

In May 1950 the First Sea Lord, Admiral of the Fleet Lord Fraser of North Cape, G.C.B., K.B.E., flying his flag in H.M.S. Nepal, made a tour of the Northern Atlantic Treaty Powers, Norway, Denmark, the Netherlands and Belgium. During his tour Admiral Fraser was received by King Haakon of Norway, King Frederick of Denmark, and Queen Juliana of the Netherlands, and had the honour of entertaining Their Majesties King Haakon and King Frederick on board H.M.S. Nepal.

LAUNCHES OF HIS MAJESTY'S SHIPS

The Fleet Carrier Ark Royal—the most up-to-date Aircraft Carrier in the world—was launched by Her Majesty the Queen in May of last year.

During the past year four more of the new 'Daring' Class Destroyers were launched, viz. His Majesty's Ships Diamond, Defender, Dainty, and Delight.

RESCUE OF AMERICAN AIRMEN IN KOREAN WATERS

Lieutenant P. Cane, R.N., Pilot of a Sea Otter from H.M.S. Triumph, and his Navigator, G. C. O'Nion, Aircrewman First Class, successfully rescued an American Naval Pilot whose aircraft was damaged in action off the North Korean Coast 80 miles from the Fleet. This gallant rescue was carried out in sea conditions in which the landing of a Sea Otter aircraft would normally have been regarded as impossible, and has earned warm congratulations and praise from the United States Navy.

DIRECTOR OF WOMEN'S ROYAL NAVAL SERVICE.

Dame Jocelyn Woolcombe, D.B.E., retired in November 1950, and Miss M. Lloyd, O.B.E., Superintendent, W.R.N.S., was appointed as Director of the Women's Royal Naval Service in her place.

ABSTRACT OF NAVY

Page	Vote	Service	ESTIMATES, 1951-52		
8	A	Maximum number of officers, seamen, boys, and Royal Marines, and members of the Women's Royal Naval Service and the Naval Nursing Service	<i>Maximum Numbers</i> — 143,500		
			Gross Estimate	Appropriations in Aid	Net Estimate
			£	£	£
12	1	Pay, etc., of the Royal Navy and Royal Marines	47,624,000	473,000	47,151,000
20	2	Victualling and clothing for the Navy	21,640,000	4,123,000	17,517,000
28	3	Medical establishments and services	1,944,000	81,000	1,863,000
36	4	Civilians employed on Fleet services	6,357,000	65,000	6,292,000
44	5	Educational services	884,000	84,000	800,000
60	6	Scientific services	12,761,000	530,000	12,231,000
86	7	Royal Naval Reserves	1,730,100	100	1,730,000
96	8	Shipbuilding, repairs, maintenance, etc.			
		Section I.—Personnel ..	28,876,000	236,000	28,640,000
		Section II.—Matériel ..	52,466,000	5,566,000	46,900,000
		Section III.—Contract work	52,920,000	1,740,000	51,180,000
126	9	Naval armaments	27,330,000	3,130,000	24,200,000
148	10	Works, buildings, and repairs at home and abroad	13,837,000	770,000	13,067,000
164	11	Miscellaneous effective services	8,049,300	2,195,400	5,853,900
176	12	Admiralty Office	5,936,000	6,000	5,930,000
212	13	Non-effective services	15,196,000	161,000	15,035,000
230	14	Merchant shipbuilding and repair services	149,500	39,500	110,000
234	15	Additional married quarters ..	1,500,100	1,500,000	100
		Total	£ 299,200,000	20,700,000	278,500,000

(a) Owing to transfers of certain services and personnel between Votes, the totals shown enable a proper comparison to be made between the provision for 1951-52 and the previous in footnotes to the various Votes.

(b) Exclusive of Supplementary Estimate of £10,000,000 (H.C. 82/1950-51).

Admiralty,
January 31, 1951 }

HALL
FRASER

A. MADDEN
M. M. DENNY

ESTIMATES, 1951-52

Estimates, 1950-51 (a)			Difference on Net Estimates		Vote
<i>Maximum Numbers</i> 143,000			<i>Increase</i> 500		A
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease	
£	£	£	£	£	
35,045,000	280,000	34,765,000	12,386,000	—	1
15,512,500	3,463,000	12,049,500	5,467,500	—	2
1,599,000	82,000	1,517,000	346,000	—	3
5,884,000	50,000	5,834,000	458,000	—	4
824 000	88,000	736,000	64,000	—	5
9,183,800	460,000	8,723,800	3,507,200	—	6
1,235,100	100	1,235,000	495,000	—	7
					8
26,351,500	446,000	25,905,500	2,734,500	—	Sec. I
32,148,000	7,593,000	24,555,000	22,345,000	—	Sec. II
34,252,500	2,627,000	31,625,500	19,554,500	—	Sec. III
15,076,000	3,000,000	12,076,000	12,124,000	—	9
10,407,500	2,097,500	8,310,000	4,757,000	—	10
7,174,700	2,208,300	4,966,400	887,500	—	11
5,375,200	5,000	5,370,200	559,800	—	12
15,306,000	121,000	15,185,000	—	150,000	13
161,100	15,100	146,000	—	36,000	14
700,100	700,000	100	—	—	15
216,236,000	23,236 000	(b) 193 000,000	85,686,000	186,000	

Net increase £85,500,000

under Votes 1, 2, 3, 4, 5, 6, 8 (Sections I, II, and II), 9, 11, and 12 have been adjusted to year, and so differ from those printed in the Navy Estimates 1950-51. Details are given

MOUNTBATTEN OF BURMA	G. E. CREASY	JAMES CALLAGHAN
M. J. MANSERGH	E. M. EVANS-LOMBE	W. J. EDWARDS
		J. G. LANG

MEMORANDUM OF THE
SECRETARY OF STATE FOR WAR RELATING TO
THE ARMY ESTIMATES, 1951-52
(Cmd. 8161)

PREFACE

The Army Estimates for 1951-52 amounted to:

Gross Expenditure	..	..	..	..	£466,520,100
Appropriations in Aid	..	..	..	..	47,720,000
Net Expenditure	..	..	..	..	<u>£418,800,100</u>

2. For the three previous years the figures were:

	1950-51	1949-50	1948-49
Gross Expenditure	£341,600,100	£356,200,000	£340,100,000
Appropriations in Aid	42,600,000	51,500,000	35,100,000
Net Expenditure	<u>£299,000,100(a)</u>	<u>£304,700,000</u>	<u>£305,000,000(a)</u>

3. Gross expenditure in the Army Estimates for 1951-52 shows a substantial increase over the Estimates for 1950-51. An increase of 60,000 in Vote A for the numbers of personnel in the Army, together with increases in rates of pay announced last October (Command Paper 8027), create a general increase of expenditure on most of the votes. In 1951-52 the gross expenditure on stores, which includes substantial provision for re-equipment, shows a considerable increase. Increased provision is also made for works services (Vote 8) and for married quarters to be paid for under the Armed Forces (Housing Loans) Act, 1949 (Vote 11). As I forecast in my memorandum for 1950-51 non-effective costs are still rising and the provision for 1951-52 shows an appreciable increase over that for the current year.

4. The Appropriations in Aid in the Estimates for 1951-52 are larger than those provided for in Estimates for 1950-51. The increases arise mainly from the increased receipts from the sale of stores to Commonwealth and allied governments and increased issues to be made from the Consolidated Fund under the Armed Forces (Housing Loans) Act, 1949.

5. These estimates are framed to meet the expenditure which it is anticipated will fall on Army Funds as part of the £3,600,000,000 defence programme which was announced by the Prime Minister in the House on September 12, 1950. A supplementary Estimate will be presented in the coming year for the additional expenditure resulting from the acceleration of this programme, described in his further statement on January 29, 1951.

GENERAL

KOREA

6. Our forces have been fighting in Korea since the first week in September 1950, when the 27th Brigade moved to Pusan from Hong Kong

(a) Excluding Supplementary Estimates.

to reinforce the defence of the United Nations bridgehead. Following the break-out from this bridgehead, the 27th Brigade took a leading part in the advance into North Korea, often being the spearhead of the attack. They have earned the highest praise and have established a reputation for dependability and fighting efficiency. The 29th Independent Brigade Group was sent from this country as a balanced force of all arms, including tanks, and arrived in Korea during the first half of November 1950. It went into action at the beginning of December and has played an important part in the withdrawal from North Korea and in operations now in progress south of Seoul.

MALAYA

7. In addition to providing forces for Korea and a large garrison in Hong Kong, the Army has had to continue to deploy a considerable force in support of the forces of law and order in Malaya. There our soldiers have continued to carry out an arduous task with skill and admirable spirit in trying climatic conditions.

TRAINING AND MANŒUVRES

REGULAR ARMY

8. Reports on the performance of our troops in Korea give satisfactory proof of the soundness of training in the Army. Training during 1951 will be based on the same principles as in previous years, though there will be alterations in its scope and extent to meet changing circumstances. The new divisions which are being raised for the field force will be exercised, with existing formations, in higher training at manœuvres to be held in the autumn of 1951, both in the United Kingdom and in Germany. An important feature of these manœuvres will be co-operation between ground and air forces for which the R.A.F. will make available the maximum number of aircraft. As in previous years, occupying forces of our allies will co-operate in the manœuvres to be held by the British Army of the Rhine.

9. The increase in the size of the active Army, consequent on the measures outlined in Command Paper 8026, and the decision to organise additional divisions, have necessitated adjustments in the training organisation in the United Kingdom. Regular units which have been employed training recruits are resuming their normal role of fighting units in the new divisions, basic training of recruits being transferred to static training centres.

10. As announced by the Prime Minister on January 29, 1951, it is our intention further to improve the country's military preparedness by recalling officers and men of the Class Z and similar reserves for 15 days' training this summer. The majority of these reservists will join units of the Territorial Army and Anti-Aircraft Command. The remainder will train with the active Army and its supporting Supplementary Reserve units.

11. In so far as operational commitments permit, training in the Far East and Middle East will be progressive, leading up, wherever possible, to formation training of all arms appropriate to the various tasks they may be called upon to perform.

12. The measures taken to arrange for the interchange of personnel for

training with the armies of other western powers have worked well, and will be further developed in 1951. Apart from their training value, these activities have done much to cement friendship and develop understanding between the armies of the North Atlantic Treaty powers and to build up mutual confidence.

SUPPLEMENTARY RESERVE

13. A number of newly raised units of the Supplementary Reserve will train in the coming year.

TERRITORIAL ARMY

14. In the past year the Territorial Army has continued the training of officers and other key personnel as instructors in unit volunteer cadres for the reception of national servicemen. The majority of field force units joined in brigade group camps during 1950, at which both unit training and all-arms collective training were carried out. In addition, week-end camps continue to be excellent means of developing normal weapon and minor tactical training. Unit training will be continued during 1951 and, in addition, divisional headquarters exercises, with signals, will be carried out by certain Territorial Army divisions.

PERSONNEL

THE REGULAR ARMY

15. The improved conditions of service and higher rates of pay announced in Command Paper 8027 had a marked effect on recruiting in the last four months of 1950. During the year 22,113 enlisted on normal engagements, 10,872 of them since September 1. Of these, 3,696 and 2,142 respectively were already serving on non-regular engagements. Experience alone will show whether this improvement can be maintained.

16. The regular content of the active Army is still below what is necessary to support efficient forces of the size we are now required, by our international commitments, to maintain. Unsettled conditions in the Far East continue to impose heavy strains on our man-power, and the outbreak of aggression in Korea, which resulted in the Government's decision to contribute to the United Nations forces despatched to meet that aggression, necessitated the steps detailed in Command Paper 8026 to augment man-power, viz.:

- (a) the extension of the period of national service with the Colours to two years;
- (b) the retention of time-expired regulars beyond the normal date of termination of their engagements and the suspension of retirement of officers;
- (c) the recall of officers of the Regular Army Reserve of Officers and other ranks of the Royal Army Reserve.

17. I am still not satisfied with the regular officer situation and with the comparative dearth of candidates of high quality for regular commissions. This matter is receiving my constant attention and I hope that the better pay and conditions of service will lead to a steady improvement.

18. We are endeavouring to make a soldier's career in the Army more attractive by changes in the conditions under which men may volunteer for

long service. We now allow soldiers below the rank of serjeant to apply to be re-engaged for 22 years' service after they have served 9 years, whereas hitherto they could not make such application until they were serving the last year of a 12 years' engagement. I propose to ask the House to agree to an amendment to the Army Act to allow soldiers who have re-engaged, to apply to continue in the Service beyond 22 years, when they have completed 15 years' service. These modifications will, we hope, attract more regular soldiers to undertake long-term engagements.

19. The last of the war-time national servicemen were released by June 30, 1950. From July 1, 1950, national servicemen under the National Service (Amendment) Act, 1948, began to pass to the Supplementary Reserve and the Territorial Army from the active Army on the completion of their 18 months' service with the Colours, and this continued up to the end of September, the arrangements working smoothly. The change in the period of national service made by the National Service Act, 1950, suspended this movement from the active Army to the Supplementary Reserve and the Territorial Army for six months, but I have no doubt that when it is resumed on April 1, 1951, the machinery will again work smoothly and efficiently and we shall steadily build up effective auxiliary forces.

WOMEN'S SERVICES

20. The new rates of pay announced in Command Paper 8027 have resulted in an appreciable improvement in the recruitment of officers for Queen Alexandra's Royal Army Nursing Corps. Whereas in the six months preceding September 1, 1950, 80 nursing officers were accepted for the Corps, 100 entered during the following three months; but there are still vacancies in the Corps and the employment of part-time civilian nurses has, therefore, continued. Recruitment for Queen Alexandra's Royal Army Nursing Corps (Territorial Army) and of nurses to the Regular Army Reserve of Officers is proceeding satisfactorily. Invitations have been issued to those who have previously served in Queen Alexandra's Imperial Military Nursing Service or the Territorial Army Nursing Service.

21. In my memorandum relating to the Army Estimates for 1950-51 I referred to our intention to open recruiting of other ranks for Queen Alexandra's Royal Army Nursing Corps. Recruiting began on July 1, 1950, and up to December 31, 1950, 298 women had been enlisted from civil life. The standard of applicant for entry to the Corps is high and the intake so far is as large as can be usefully absorbed.

22. The new rates of pay announced in Command Paper 8027 have not had as much effect on recruiting for the Women's Royal Army Corps as in the case of men. Nevertheless, recruiting has been maintained at a consistently higher rate than for 1949, 2,523 having been enlisted from civil life during 1950. Recruitment into the Women's Royal Army Corps (Territorial Army) has not been so satisfactory. During 1950, 4,675 volunteers were enlisted.

DISCIPLINE

23. The improvement in discipline throughout the Army which was noted in 1948 and 1949 has continued throughout 1950. Indeed, the

incidence of crime has been greatly reduced having regard to the size of the Army. I regret that the principal crimes still remain absence without leave and desertion. The next most prevalent offence is stealing.

24. Every effort has been made during the year to interest the soldier in his unit and its traditions, and to foster *esprit de corps*. Available playing fields and attractions in barracks are, however, still far from adequate to compete with the amenities which can be found in almost any town near a military station.

EDUCATION

25. I referred in my memorandum relating to Army Estimates for 1950-51 to the strain imposed on the Army's educational resources in dealing with men called up under the National Service Acts whose standard of education was low. Thanks to the co-operation of the Minister of Labour and National Service the number of such men called up for the Army was lower in 1950, thus enabling us to devote more of our limited educational resources to more advanced work.

26. The year 1950 has seen the examination system consolidated as part of the normal educational work of the Army. Progress has been made with the provision at home and overseas of educational facilities in the Army comparable with those of civilian life, and the work of the Central Committee for Education in His Majesty's Forces has been of great assistance. The latest development is the establishment in selected areas of Higher Education Centres which will provide facilities for study up to Intermediate standard on a wider scale than before.

WELFARE

27. Maintenance of the highest possible standard of welfare, particularly for troops abroad, continues to receive close attention from all concerned. In particular, every effort has been made to provide the best possible welfare facilities for our troops in Malaya and those sent to Korea last autumn. I acknowledge with gratitude the number of parcels which members of the public sent at Christmas and the New Year to the troops in Korea, and there can be no doubt that this token of the interest in our men was greatly appreciated by them.

28. The Soldiers', Sailors', and Airmen's Families Association have responded with their usual zeal and efficiency to the additional calls made on them in connection with the families of the reservists recalled to the Colours. The other voluntary philanthropic organisations on which the Army relies for many services have again given valuable help in many directions.

29. The Forces Broadcasting Service continues to produce programmes for overseas stations not otherwise suitably served and the Army Kinema Corporation provides for the troops throughout the world a wide selection of films of varied interest. Professional live entertainment continues for troops in Germany, Austria, Trieste, and the Middle East, and will be provided for troops in Korea if and when conditions permit.

RESETTLEMENT

30. Considerable progress has been made in arrangements for the resettlement in civil life of officers and men, as a result of the work of the

Advisory Council on the Relationship between Employment in the Services and Civilian Life. The fields of employment open to ex-regulars have been widened and the chances of speedy employment are now greatly increased. The problem of the ex-regular officer aged about 45 continues, however, to be more difficult of solution.

31. The Re-instatement in Civil Employment Act, 1950, extended re-instatement rights to all reservists compulsorily recalled to the Colours after July 15, 1950, and to national servicemen who undertook certain limited extensions of service with the Colours after they had completed their full-time service under the National Service Acts.

HEALTH

32. The health of the Army has continued to be good during 1950. The rates of admission to hospitals in the United Kingdom and the Middle East have remained substantially the same as in previous years, whilst there has been a steady reduction in the rates for the British Army of the Rhine and for West Africa. On the other hand, there has been a marked increase in the rate in the Far East which has returned to the level operative in 1946. This is due in the main to increased operational activity and shows principally in skin and venereal diseases. Renewed efforts are being made to deal with this problem. On the other hand, I am glad to record that the incidence of malaria in the Middle East and Far East has again fallen slightly.

33. Research work has continued throughout the year and a medical team visited Canada and the United States of America in the spring of 1950 to study medical problems in sub-arctic regions. The study of the problem of protection against flash burns and the treatment for such burns has also gone on steadily.

SUPPLEMENTARY RESERVE

34. Recruiting for the Supplementary Reserve was opened during the year. As in the Territorial Army, the primary requirement is for leaders and trainers for the national servicemen who will be joining this reserve from the active Army for their part-time service. I hope to draw these from:

- (a) men who cannot spare time outside an annual camp period,
- (b) men who live too far away from any Territorial Army Centre to take an active part in the life of a Territorial Army unit.
- (c) experts who are more suited to the technical units of the Supplementary Reserve.

In October a direct appeal was sent to some 180,000 individuals, but although a number of replies have been received, only 394 had joined by January 24, 1951.

TERRITORIAL ARMY

35. The growth of the reserve Army has been delayed by the measures taken to strengthen the active Army and in particular the extension of the period of full-time service by six months, and the consequent postponement of the time when national servicemen join the Territorial Army. The change-over to the revised Order of Battle which I announced in my

Estimates speech a year ago has been successfully completed, thanks to the loyal and public-spirited co-operation of all those concerned. National servicemen passed into the Territorial Army at regular fortnightly intervals from the beginning of July until the end of September and these are being assimilated successfully into their new units.

36. The volunteer strength of the Territorial Army continues to show a slow rise and on December 1, 1950, was 77,206 as compared with 72,165 on December 1, 1949. There is, however, still a shortage of senior N.C.Os. with war service, to lead and train the fine material coming into the Territorial Army.

37. Some interruptions in the programme for the provision of Territorial Army Centres and week-end training centres inevitably resulted from the changes during the year consequent on the revised Order of Battle. We have, however, pressed forward with those which were already under construction and with arrangements for the provision of new centres where needed to meet the changed conditions.

CADET FORCES

38. The Combined Cadet Force continues to provide valuable preparatory training for the Army and produces two thirds of the officer cadets for both the active and reserve Armies. A further 10 per cent. come from the Army Cadet Force. The strength of the Cadet Forces on July 31, 1950, were:

	<i>Officers</i>	<i>Cadets</i>
C.C.F. (Army and basic sections) ..	1,071	50,302
A.C.F.	6,144	68,015

The Army Cadet Force needs a flow of young men with military training to replace older men as junior regimental officers. A proportion of national service officers may serve with the Cadet Forces for their part-time national service, and I hope that a flow of these officers to the Cadet Forces will begin in 1951.

ARMAMENTS AND STORES

39. Army Estimates for 1951-52 include provision for the first instalment of a rearmament programme which will make possible within a reasonable time the re-equipment of the Army with new modern weapons. Some two-thirds of the estimated expenditure on armaments and stores is designed to provide tanks, anti-aircraft and other weapons, and steps which have already been taken will ensure a further acceleration in delivery of these in 1952-53. The remaining third of the expenditure proposed is to provide equipment and stores for the day to day maintenance of the Army and for a further modest improvement in living accommodation.

40. As foreshadowed in the Prime Minister's statement we are taking steps further to accelerate the re-equipment of the Army in keeping with our undertaking at the recent Brussels Conference. The cost of these measures is not reflected in these Estimates and our requirements in this connection will be provided for in the Supplementary Estimate mentioned in paragraph 5 above.

41. The second year of the Ministry of Supply programme for rebuilding wheeled vehicles for the Army has been completed and has been supplied

mented by the rebuilding of numbers of vehicles in Army workshops in the United Kingdom and in Germany. The total number of vehicles rebuilt up to the end of 1950 was 23,000. During 1951 the maximum capacity not only for rebuilding of wheeled vehicles but also for the repair and renewal of existing weapons, both in the Army's workshops and that available to the Ministry of Supply, will be fully occupied on these vital tasks. This work makes an important contribution to the immediate preparedness of the Army.

SUPPLIES

42. These Estimates provide for the normal maintenance requirement of the Army and a small reserve of liquid fuels. We have, however, decided to increase this reserve and add to our reserves of "combat rations" and the cost of these measures will be provided for in the Supplementary Estimate foreshadowed in paragraph 5.

WORKS

GENERAL

43. Efforts are still continuing to improve the living conditions of the Army in both single and married accommodation. The effects of the Housing Loan (Armed Forces) Act, 1949, are now beginning to appear. As in the case of armaments, stores, and supplies, further measures arising from the accelerated defence programme will entail additional expenditure (for example, on storage and anti-aircraft defences), to be provided for later in my Supplementary Estimate.

HOME

44. A large construction programme is being undertaken in respect of anti-aircraft defences, storage and other works which have become necessary owing to the deterioration in the international situation, and additional funds have been included for these special projects. The rebuilding of Tidworth Barracks is proceeding according to plan, and further schemes of modernisation will be developed during the year.

ABROAD

45. Progress continues to be made in improving the standard of accommodation for single and married officers and men. Special provision has again been made for defence works and the temporary housing of the additional troops now stationed in Malaya and Hong Kong.

AFTERMATH TASKS

46. Bomb disposal and mine clearance have proceeded at a steady rate and it is hoped to complete the programme by mid-1952. The dumping of unstable ammunition will continue for some time. The maintenance of accommodation for certain married families is likely to be necessary until the civilian housing situation improves.

JOHN STRACHEY

THE WAR OFFICE,
February 13, 1951.

ABSTRACT OF ARMY

Page	Vote	Service	ESTIMATES, 1951-52		
8	A	Maximum number of officers and other ranks to be maintained for Army Service			527,000
			Gross Estimate	Appropriations in aid	Net Estimate
16	1	Pay, etc., of the Army	£121,830,000	£11,660,000	£110,170,000
28	2	Reserve Forces Territorial Army and Cadet Forces	13,750,000	110,000	13,640,000
42	3	War Office	2,668,000	48,000	2,620,000
66	4	Civilians	46,644,000	1,034,000	45,610,000
110	5	Movements	23,120,000	350,000	22,770,000
116	6	Supplies, etc.	51,940,000	9,900,000	42,040,000
124	7	Stores	147,340,000	13,000,000	134,340,000
132	8	Works, buildings, and lands ..	32,030,000	3,890,000	28,140,000
144	9	Miscellaneous effective services	3,600,000	2,130,000	1,470,000
158	10	Non-effective services	18,098,000	98,000	18,000,000
172	11	Additional married quarters ..	5,500,100	5,500,000	100
		Total	466,520,100	47,720,000	418,800,100

(a) Excludes Supplementary Estimate (55,000) (H.C. 13 of 1950-51).

(b) Excludes Supplementary Estimate of £20,000,000 (H.C. 81 of 1950-51).

ESTIMATES, 1951-52

Estimates, 1950-51			Difference on Net Estimates		Vote
		467,000 (a)	Increase 60,000		A
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease	
94,350,000	9,720,000	84,630,000	25,540,000	£ —	1
11,155,000	110,000	11,045,000	2,595,000	—	2
2,347,000	52,000	2,295,000	325,000	—	3
45,935,000	1,330,000	44,605,000	1,005,000	—	4
22,000,000	350,000	21,650,000	1,120,000	—	5
43,670,000	10,650,000	33,020,000	9,020,000	—	6
68,220,000	10,400,000	57,820,000	76,520,000	—	7
29,250,000	3,905,000	25,345,000	2,795,000	—	8
4,143,000	2,110,000	2,033,000	—	563,000	9
16,630,000	73,000	16,557,000	1,443,000	—	10
3,900,100	3,900,000	100	—	—	11
341,600,100	42,600,000	299,000,100 (b)	120,363,000	563,000	
Net increase			£119,800,000		

JOHN STRACHEY
MICHAEL STEWART

W. J. SLIM, *C.I.G.S.*
J. T. CROCKER, *A.G.*
G. IVOR THOMAS, *Q.M.G.*
N. C. D. BROWNJOHN, *V.C.I.G.S.*
J. F. M. WHITELEY, *D.C.I.G.S.*

G. W. TURNER

The War Office,
February 1, 1951.

MEMORANDUM BY THE
SECRETARY OF STATE FOR AIR TO ACCOMPANY
AIR ESTIMATES FOR 1951-52

(Cmd. 8162)

PREFACE

1. The net total of Air Estimates for 1951-52 is £328,750,000. Provision is also made for a maximum sum of £7,200,000 to be issued out of the Consolidated Fund, under the Armed Forces (Housing Loans) Act, 1949, for the construction of additional married quarters.

2. The Estimate is £105,750,000 more than in 1950-51 (excluding the Supplementary Estimate presented on January 23, 1951). The main increase in expenditure will be on aircraft and stores required for the expansion and re-equipment of the Royal Air Force. Higher average strengths of air force personnel and improvements in rates of pay and bounties will require increased provision, while additional expenditure will also be incurred on the development of airfields and the building of extra technical accommodation.

3. The Estimates themselves are based on the £3,600 million programme which was drawn up last summer and do not provide for the additional expenditure that will result in 1951-52 from the further measures recently announced by the Prime Minister for the acceleration and increase of the defence effort. A Supplementary Estimate to provide for expenditure on these measures will be presented in due course. But for general convenience the paragraphs which follow take into account not only the programme covered by the Estimates but also the further measures involved.

GENERAL

4. The front line strength of the Royal Air Force increased considerably during the last year, notably in Fighter Command and the British Air Forces of Occupation, and this is only a first step towards the much more substantial increases which will be achieved during the next two years, described in paragraphs 5-7 below, now that greater resources of men and money are available to the Royal Air Force.

5. In Fighter Command, the doubling of the front line of the regular day fighter squadrons has been completed and there will be a further large increase in day fighter strength. The night fighter force will be greatly increased and equipped with jet fighters. Good progress is being made with the improvement of the radar chain.

6. The Canberra will come into squadron service this year and our tactical bomber forces will in due course be greatly strengthened by the large number of squadrons to be formed on this type. Meanwhile, the medium bomber force will be maintained on Washingtons and Lincolns until later types come into service.

7. There will also be a substantial increase in Coastal Command, where the Shackleton is now coming into squadrons, and the rundown of

Transport Command has been halted. Jet fighters have been flown out to Singapore for the re-equipment of squadrons of the Far East Air Force.

8. The build-up and support of this expanded force requires a big increase in the supporting training organisation. A number of new schools have been formed for both air and ground training. A generous offer by the Canadian Government to train pilots and navigators for the Royal Air Force has been accepted and training has now started. It is hoped that the Royal Air Force will also be able to use the increased flying training facilities which the Canadian Government has offered to North Atlantic Treaty countries.

9. To improve the state of readiness of our air defences, it has been decided to call up the fighter squadrons of the Royal Auxiliary Air Force for about three months and to give a period of continuous training during the summer to the auxiliary and reserve personnel who will man the radar chain.

10. The operations carried out by the Royal Air Force during the past year have been mainly in the Far East theatre. In Malaya, the Far East Air Force, assisted by Lincolns of Bomber Command and of the Royal Australian Air Force and by Australian and New Zealand Dakotas, continued its work of air strikes, reconnaissance, and air supply in the operations against bandits. Sunderland flying boats have carried out reconnaissance and transport work in support of the United Nations forces in Korea. Hastings aircraft of Transport Command have carried troops and equipment from the United Kingdom to Japan and have been used in a regular casualty evacuation service between the Far East and the United Kingdom. Over 1,300 sick, injured, and wounded were flown to the United Kingdom from Korea and Malaya during 1950. The work of the Middle East Air Force has included operations to preserve internal security in Eritrea and Aden.

11. In all Commands there has been an increase in the scale and intensity of operational training, in which Allied forces have often joined. In particular, a major air defence exercise was held in the United Kingdom during October in which the air forces of the United States, France, Holland, Belgium, Norway, and Denmark took part. Visits were paid by No. 213 Squadron to Greece and by No. 120 Squadron to Pakistan, and a Swedish Vampire squadron visited this country.

12. Meanwhile, co-operation with other Commonwealth air forces and with Allied air forces has been even closer than before. Important new developments include the following: a number of airfields are being built in collaboration with the United States Air Force for use by American bomber groups; the American bombers already in this country have been joined by American fighters; and a Royal Canadian Air Force fighter squadron has recently arrived to train with Fighter Command.

13. In July 1950 the Royal Air Force gave a Display at Farnborough in Hampshire, in which a number of Commonwealth and Allied aircraft took part. The Display was well received by the public.

PERSONNEL

14. The post-war rundown of the Royal Air Force has been reversed and the uniformed strength of the force, which was 202,000 in March 1950, is

now 230,000. This build-up of strength has been achieved by recruiting more regulars, extending the period of full-time national service from 18 months to 2 years, and by retaining temporarily the services of time-expired regulars. It is now possible to man units fully in all but a few specialist categories and thus materially improve the efficiency and balance of the force as a whole.

15. A marked and very welcome impetus has been given to regular recruiting by the substantial increases in pay which were introduced last year, and also the higher rates of short service gratuity which were introduced at the same time for officers of the General Duties Branch and aircrew. Special schemes, due to end in December 1951, offering tax-free bounties have also been introduced to encourage highly-trained serving regular airmen to re-engage and men with previous experience to re-enlist as regular airmen. It is hoped that the recent introduction of flying pay will induce more young men of high quality to volunteer for flying duties.

16. Entries for pilot and navigator employment have improved but are nevertheless substantially below the greatly increased intake required for the expanded force. Entries to Cranwell are satisfactory but the number of university graduates accepting permanent commissions falls short of what is needed. As a means of attracting candidates of a higher standard and of achieving the aim that all pilots and navigators shall ultimately be officers, all regular and national service pilot and navigator cadets will, on successful completion of their initial training, be granted commissions in the rank of acting pilot officer on probation. The increased officer requirements for 1951-52 will have to be met by further extensions of service and the re-entry of war-time officers in addition to the normal practice of commissioning of suitable airmen.

17. Airmen of all trades will be eligible for selection for aircrew duties with the prospect of continuing their careers on the ground, when they are no longer required for flying duties, up to the age of 55. The non-commissioned officer rank titles for aircrew have been restored. Pilots now serve in three ranks—sergeant pilot, flight sergeant pilot, and master pilot—and similar arrangements have been made for navigators, signallers, engineers, and gunners.

18. The long-term effect of the measures taken to improve regular recruiting cannot, of course, be assessed with certainty but the results achieved to date in the ground trades are very satisfactory. The rate at which men registering for national service have enlisted on three-year regular engagements, followed by two and a half years' reserve service, has increased substantially. Other forms of recruitment have also improved, and so long as present trends are maintained an adequate flow of short service airmen is assured.

19. Short term engagements, however, are expensive in training costs and do not provide all the warrant officers and senior non-commissioned officers or highly skilled and experienced tradesmen essential for an efficient air force. To meet this need a new trade structure was introduced into the Royal Air Force in January 1951, which will increase manning flexibility and enhance career prospects. Long service careers to the age of 55 can now be offered to a large proportion of airmen through the introduction of a new series of technician ranks which will exist side by side with the conventional non-commissioned officer ranks. These

technician ranks carry a special status and provide an alternative line of advancement for skilled men for whom there is no future as non-commissioned officers.

20. There has been a slight, but steady, increase during the past year in the numbers of aircraft and administrative apprentices entering the Service, but the intake still falls far short of the large numbers needed. It is encouraging to note, however, that applications for the forthcoming examinations for apprentices show an increase over previous figures. The intake of boy entrants is very satisfactory.

21. Recruitment for the Women's Royal Air Force, a force composed entirely of volunteers, is not yet meeting our requirements, although the new rates of pay and better prospects of advancement under the new trade structure offer a good career to young women in the Service. Improved conditions and the opening of new branches to women have also strengthened the appeal the Force makes to women who are suitable for commissions, and the gap between the number of women officers required and commissions granted is steadily closing.

22. The Air Ministry continues to play a large part in the arrangements the Government are concerting, with the ready co-operation of public and private employers, to ensure the re-settlement of ex-regulars in positions suitable to their age, experience, and qualifications.

AUXILIARY AND RESERVE FORCES

23. In addition to its fighter and air observation post squadrons, the fighter control units and the Regiment squadrons, the Royal Auxiliary Air Force now includes an important radar reporting unit and a transport squadron. The radar reporting unit is located in central London, for the convenience of members of the unit and potential recruits, but its operational task would be elsewhere. Other units of the same kind are contemplated. The formation of further auxiliary transport squadrons is being planned in conjunction with air charter firms.

24. As mentioned last year, the 20 fighter squadrons of the Royal Auxiliary Air Force are part of Fighter Command. The 26 auxiliary fighter control units and the radar reporting unit are now being similarly transferred to Fighter Command, as an integral and essential part of the air defence system. This change will be completed early in the year.

25. The strength of the Royal Air Force reserves will increase rapidly with the influx of national service officers and men who have completed their full-time service. These officers and men will do their reserve training at Royal Air Force Stations. An important development is the formation of reserve flights on Fighter Command radar stations: the members of these flights will give productive service and assist in the manning of these first-line stations.

26. Membership of university air squadrons, hitherto confined to candidates for pilot training, is being extended in some cases to include training as navigators and in certain other duties.

27. As from April 1, 1951, certain administrative responsibilities in respect of the Air Training Corps will be transferred to Territorial and Auxiliary Forces Associations in Scotland. In the light of experience gained in Scotland, consideration will be given to the desirability of the

transfer of similar responsibilities to Territorial and Auxiliary Forces Associations over the United Kingdom as a whole.

28. The Air Training Corps and the Royal Air Force sections of the Combined Cadet Force continue to provide a strong and valuable pre-entry organisation and this year the Corps celebrates its tenth anniversary. Two hundred boys entered training under the scheme for flying scholarships introduced in 1950, under which selected cadets are trained to private pilot's licence standard at civil flying clubs, and a similar number will be trained this year.

29. The Royal Air Force Volunteer Reserve now accepts suitable volunteers (men and women) who have reached the private pilot's licence standard. These volunteers continue their flying training at reserve flying schools.

30. In 1950 the Royal Observer Corps celebrated its Silver Jubilee. His Majesty The King was graciously pleased to assume the position of Air Commodore-in-Chief and to institute the Royal Observer Corps Medal for long and meritorious service. Members again took part in exercises with the Royal Air Force and over 2,000 voluntarily attended the summer training camp.

WORKS

31. The programme for extending and developing airfields and technical facilities, for developing the radar chain, and for building barracks and messes is being both enlarged and accelerated to meet the needs of the expanding Force. It is hoped to continue to build married quarters at about the present rate. At home, approximately 1,750 permanent married quarters will have been completed during 1950-51. Overseas, about 300 permanent married quarters will have been completed during 1950-51.

SUPPLY

32. Production of combat aircraft is being stepped up to meet the expansion and re-equipment of the Force and there will be a substantial increase in deliveries of jet types of aircraft as compared with the current year. Corresponding provision is being made for trainer aircraft that have been developed to train pilots and aircrews up to the high standard necessary for advanced operational aircraft. The types include the Chipmunk, Balliol, and Meteor T.7 for pilot training and the Varsity for aircrew training. Production of airborne and ground equipment, spares of all kinds and general stores is also being increased to keep in step with the requirements of the expanding Force.

METEOROLOGY

33. The weather forecasts issued daily by the British Broadcasting Corporation at 1755 hours are now on a regional basis so that more detail can be given about the weather expected in a particular area. The service to farmers and market gardeners has been improved by the issue of warnings of autumn and spring frosts, and the service to stockowners by the issue of hill snow warnings. Experimental work is in progress with a view

to providing British Railways with more exact information on the accumulation of ice on conductor rails.

34. To provide necessary information for the operation of jet aircraft, upper air analysis is being extended. Warnings of the existence or expected occurrence of high speed air currents in the upper air are now issued for the area within 500 miles of the British Isles. For the general benefit of aviation, the Meteorological Office has published a series of charts on the upper winds over the globe to a height of 40,000 feet and a similar work on upper air temperature is nearing completion. The exploration of the stratosphere by aircraft of the Meteorological Research Flight continues. Investigations have been made into thunderstorm clouds and especially the conditions of turbulence and icing existing in these clouds.

ARTHUR HENDERSON

AIR MINISTRY,
February 13, 1951.

ABSTRACT OF AIR

Page	Vote	Service	ESTIMATES, 1951-52		
8	A	Maximum number of officers, airmen, and airwomen to be maintained for Air Force Service	270,000		
			Gross estimate	Appropriations in aid	Net estimate
10	1	Pay, etc., of the Air Force ..	£78,700,000	£1,700,000	£77,000,000
26	2	Reserve and Auxiliary Services	1,571,000	1,100	1,569,900
40	3	Air Ministry	3,342,000	132,000	3,210,000
72	4	Civilians at outstations	23,050,000	660,000	22,390,000
98	5	Movements	9,300,000	650,000	8,650,000
106	6	Supplies	44,130,000	4,690,000	39,440,000
114	7	Aircraft and stores	150,750,000	18,000,000	132,750,000
126	8	Works and lands	44,920,000	7,420,000	37,500,000
140	9	Miscellaneous effective services	3,360,000	1,165,000	2,195,000
158	10	Non-effective services	4,166,000	121,000	4,045,000
178	11	Additional married quarters ..	7,200,000	7,200,000	100
		Total	£370,489,100	£41,739,100	£328,750,000

(a) Exclusive of Supplementary Estimate of 28,000 (H.C. 17 of 1950-51).

(b) Exclusive of Supplementary Estimate of £10,000,000 (H.C. 80 of 1950-51).

ARTHUR HENDERSON
AIDAN CRAWLEY

J. C. SLESSOR
L. N. HOLLINGHURST

Air Ministry,
February 2, 1951

ESTIMATES, 1951-52

Estimates, 1950-51			Differences on Net Estimates		Vote
215,000 (a)			Increase 55,000		A
Gross Estimate	Appropriations in Aid	Net Estimate	Increase	Decrease	
54,310,000	1,460,000	52,850,000	24,150,000	£ —	1
1,444,000	1,100	1,442,900	127,000	—	2
2,976,000	118,000	2,858,000	352,000	—	3
19,720,000	568,000	19,152,000	3,238,000	—	4
9,250,000	800,000	8,450,000	200,000	—	5
32,193,000	4,293,000	27,900,000	11,540,000	—	6
95,500,000	17,500,000	78,000,000	54,750,000	—	7
30,000,000	3,560,000	26,440,000	11,060,000	—	8
2,722,000	1,160,000	1,562,000	633,000	—	9
4,437,000	92,000	4,345,000	—	300,000	10
4,900,100	4,900,000	100	—	—	11
257,452,100	34,452,100	223,000,000 (b)	106,050,000	300,000	
Net increase			£105,750,000		

W. F. DICKSON
R. A. COCHRANE

A. P. M. SANDERS
J. N. BOOTHMAN

J. H. BARNES

THE SYSTEM OF COMMAND ESTABLISHED WITHIN THE NORTH ATLANTIC TREATY ORGANISATION

(Cmd. 8214)

I. INTRODUCTION

1. The purpose of this White Paper is to describe in a convenient summary form the command system as at present developed within the area covered by the North Atlantic Treaty and to explain how it has been fitted into the framework of the North Atlantic Treaty Organisation as a whole. The White Paper does not attempt to deal with the political, financial, production, and supply aspects of N.A.T.O.

2. A White Paper on Collective Defence Under the Brussels and North Atlantic Treaties was presented to Parliament in February 1950 (Cmd. 7883). Since then N.A.T.O. has got into its stride and, under the spur of the changing world situation, it has completed what may be termed the purely planning stage of its military development. In order to build up an effective defence organisation, the next step has been to create a system of command and at the same time to strengthen the existing military organisation so as to ensure that the instructions and guidance of the North Atlantic Powers can be speedily and effectively implemented and that quick decisions can be taken on North Atlantic military problems in general.

3. So far, only the framework of a command system has been created, and in one important area, the Mediterranean, the framework is still incomplete. The foundations have, however, been laid and, so far as the higher military direction of N.A.T.O. as a whole is concerned, it has been possible to devise a system which not only gives the Twelve Powers the opportunity to participate in the solution of the particular problems with which they are concerned, but also ensures that the responsibility for carrying out the decisions rests in the hands of a body which is smaller and, therefore, able to act more rapidly. N.A.T.O., like any other organisation in the free world, is developing all the time and it would be surprising if some of the twelve free and independent States of which it is composed did not come forward from time to time with proposals for further alteration and improvement. As it stands, however, it is no exaggeration to say that N.A.T.O. represents an achievement in peace-time military co-operation among free and independent nations for which there is no precedent in the world's history.

II. THE HIGHER MILITARY DIRECTION OF N.A.T.O.

THE DEFENCE COMMITTEE

4. Ministerial authority in the defence field is exercised, under the political guidance of the North Atlantic Council of Foreign Ministers, by the Defence Committee, which consists of the Defence Ministers of the Twelve Powers. Three meetings of the Defence Committee were held last year: at The Hague in April, at Washington in October, and at Brussels

in December. Apart from these formal meetings, however, ministerial authority on military matters is being exercised all the time since North Atlantic Treaty problems are constantly being submitted to individual Ministers of Defence by the Chiefs of Staff of the Twelve Powers. Moreover, the Deputies of the North Atlantic Council, who are responsible for giving political guidance to N.A.T.O., are in constant session.

5. The meeting of the Defence Committee in Brussels in December was followed by a joint meeting with the North Atlantic Council and, as so many defence problems raise political issues, which fall, to some extent, outside the defence field, these joint sessions may well become more frequent in the future. The Chair at the Defence Committee meetings at The Hague and Washington was taken by the United States Secretary for Defence; it has now passed to Belgium.

THE MILITARY COMMITTEE AND THE STANDING GROUP

6. Under the general supervision of the Defence Committee, the Military Committee, which consists of the Chiefs of Staff of the Twelve Powers, remains the supreme military authority in N.A.T.O. One Chief of Staff of each of the Twelve Powers normally attends the Military Committee meetings. Meetings of the Military Committee preceded each meeting of the Defence Committee held last year and the approval of the Chiefs of Staff of the Twelve Powers was there given to the various matters subsequently submitted to the Defence Committee. It has always been accepted, however, that military decisions on N.A.T.O. problems could not wait for periodic sessions of the Military Committee, and the Standing Group was, therefore, constituted, with its headquarters in Washington, to act as a permanent executive agency of the Military Committee. The Standing Group, which consists of the Chiefs of Staff of France, the United States, and the United Kingdom working through their permanent representatives in Washington, would within the area covered by the North Atlantic Treaty exercise in war functions similar to those exercised by the Combined Chiefs of Staff during the last war. As the executive authority in the military field in peace-time of twelve free and independent States, the Standing Group has a task which differs considerably from that of the Combined Chiefs of Staff and is in many respects more difficult. It should be emphasised that the Standing Group remains technically an organ of the Military Committee and, just as any of the Chiefs of Staff of the Twelve Powers is entitled to attend the meetings of the Military Committee, so any of the Chiefs of Staff of France, the United States, and the United Kingdom are entitled themselves to represent their country at meetings of the Standing Group and, in fact, have done so.

7. The permanent representatives of the Chiefs of Staff on the Standing Group are:

Marshal of the Royal Air Force Lord Tedder: *United Kingdom.*

Vice-Admiral Jerauld Wright: *United States.*

Lieutenant-General Paul Ely: *France.*

Lord Tedder's term of office expires this month and he will then be succeeded by Air Chief Marshal Sir William Elliot.

8. The need for a small compact body such as the Standing Group which can give quick decisions on military problems, has been accepted

by all the N.A.T.O. countries. This authority was confirmed and strengthened at the meetings of the North Atlantic Council and the Defence Committee held at Brussels in December when the Supreme Allied Commander for Europe was appointed and a North Atlantic Treaty Command Organisation for Europe was established. It was there recognised that the Standing Group should be responsible for higher strategic direction throughout the North Atlantic Treaty area and that it should be authorised to issue instructions and guidance on military matters to the various N.A.T.O. commands. The Standing Group is provided with a staff comprising a number of international Working Teams which consist of officers from the armed forces of France, the United States, and the United Kingdom.

MILITARY REPRESENTATIVES COMMITTEE

9. As a consequence of these developments it was fully recognised that effective means must be devised to ensure that the views of the countries which are not members of the Standing Group should be fully represented. To this end the Defence Committee, at its meeting in Brussels in December, authorised the establishment of a Military Representatives Committee which is a permanent body with its headquarters in Washington directly representing the Chiefs of Staff of all the North Atlantic Treaty Powers and thus making frequent meetings of the Military Committee unnecessary. The Standing Group works in the closest collaboration with the military Representatives Committee and in policy and planning matters consults the Representatives of the member nations concerned. The staff of the Military Representatives co-operate with the Working Teams of the Standing Group in matters which concern them.

A chart of the higher military organisation of N.A.T.O. is at Appendix A.

III. THE COMMAND SYSTEM

REGIONAL PLANNING GROUPS

10. The preliminary planning work was carried out by the five Regional Planning Groups into which N.A.T.O. had been divided composed as follows:

<i>Regional Planning Group</i>	<i>Composition</i>
Western European	Belgium, France, Luxembourg, Netherlands, United Kingdom.
Northern European	Denmark, Norway, United Kingdom.
Southern European-Western Mediterranean	France, Italy, United Kingdom.
North Atlantic Ocean	Belgium, Canada, Denmark, France, Iceland, Netherlands, Norway, Portugal, United Kingdom, United States of America.
Canadian-United States	Canada, United States of America.

Canada and the United States were represented by observers in the three European Regional Groups.

11. The grouping of the Twelve Powers in these five Regional Groups was effective for preliminary planning purposes. When this work had

been completed it was plain that a command organisation was required which would not only co-ordinate the preliminary planning work undertaken by the Regions but would also have executive authority to train and weld together forces of the various Powers and to direct military operations should necessity arise.

WESTERN UNION COMMANDERS-IN-CHIEF COMMITTEE

12. A nucleus land, air, and naval command, with Field-Marshal Montgomery as permanent military chairman, had been established in Western Union as long ago as October 1948 and much work, which will be of great value to the North Atlantic command organisation, was carried out by the Western Union Commanders-in-Chief. They were, however, only a planning organisation, and had no executive authority. Moreover, they were concerned only with the five countries of Western Union. A more comprehensive command system had to be created to cover the far wider area of the North Atlantic Treaty.

THE SUPREME HEADQUARTERS ALLIED POWERS IN EUROPE (S.H.A.P.E.)

13. The problem of creating a comprehensive command system for the whole North Atlantic area was first considered at ministerial level at the Defence Committee held in Washington in October 1950. It was again considered at the meeting of Defence Ministers held in Brussels in December. The Twelve Powers were fully in agreement as to the kind of command system that was required for Europe and they had no doubts whatever about the officer who should be asked to assume the appointment of Supreme Allied Commander Europe. At a joint session of the North Atlantic Council and the North Atlantic Defence Committee, held in Brussels on December 19, 1950, General of the Army Dwight D. Eisenhower, who had been made available for that purpose by the President of the United States, was appointed Supreme Allied Commander Europe. It was also decided that General Eisenhower should establish his headquarters in Europe and should be assisted by an international staff drawn from the North Atlantic Treaty countries which contributed forces to his command. General Eisenhower assumed command as from midnight April 1-2, 1951, and the appropriate forces were transferred to his command with effect from that date.

14. The Supreme Headquarters Allied Powers in Europe (S.H.A.P.E.) is responsible, under the general direction of the Standing Group, for the defence of the allied countries of continental Europe against invasion and the Supreme Allied Commander Europe would, in time of war, control all land, sea, and air operations to this end. Internal security and defence of coastal waters remain the direct responsibility of the national authorities concerned but the Supreme Commander would have full authority to carry out such operations in these areas as he considered necessary for the defence of Western Europe.

15. In peace-time the functions of the Supreme Allied Commander Europe may be defined as follows:

- (a) The organisation and training of the various units of the armed forces of the North Atlantic countries which have been allotted

to his command so as to ensure that they are knit together into one unified force.

- (b) The preparation of defence plans.
- (c) Making recommendations to the Standing Group about such matters as the adequacy and training of his forces and indeed on any military questions which affect his ability to carry out his responsibilities in peace or war.

16. The Supreme Commander ordinarily receives his directions from the Standing Group but, following General Eisenhower's example during the last war, he has the right of direct access to the Chiefs of Staff of any of the Twelve Powers and, in exceptional circumstances, to Defence Ministers and Heads of Governments. In addition, all the North Atlantic countries maintain military liaison officers at S.H.A.P.E. who are responsible for day-to-day liaison with the Chiefs of Staff of the North Atlantic countries. The Supreme Commander obtains his political guidance through the Standing Group from the Council Deputies.

THE SUPREME ALLIED COMMANDER'S DEPUTIES

17. General Eisenhower has appointed Field-Marshal Viscount Montgomery of Alamein as Deputy Supreme Allied Commander Europe. Field-Marshal Montgomery would assume the functions of Supreme Commander in the absence, for any reason, of General Eisenhower and, as his Deputy, he has a special responsibility for the training and organisation of the forces allotted to S.H.A.P.E. He is thus able to continue the work that he carried out as Chairman of the Western Union Commanders-in-Chief Committee. General Eisenhower also has a Deputy (Air), Air Chief Marshal Sir Hugh Saunders, R.A.F., and a Deputy (Navy), Admiral Andre Lemonnier of the French Navy.

18. General Eisenhower's command has been divided into three subordinate commands, a central, a northern, and a southern sector. The precise boundaries of these subordinate commands have not yet been settled but, broadly speaking, they correspond to the area of the three European Regional Planning Groups.

THE CENTRAL SECTOR

19. Of the three areas of command, it is plain that the central sector, which comprises the land mass of Western Europe, is the most important and General Eisenhower will retain a measure of personal command in this sector. Under him there will be:

Commander-in-Chief Allied Land Forces: General A. Juin (*France*).

Commander-in-Chief Allied Air Forces: Lieut.-General L. Norstad (*U.S.A.*).

Flag Officer Central Europe: Vice-Admiral Robert Jaujard (*France*).

General Juin will not take up his appointment immediately. It is understood that he will remain as Resident-General in Morocco for the present and, in the meantime, General Guillaume, who commands the French forces in Germany, is taking General Juin's place.

THE NORTHERN SECTOR

20. The command arrangements in Northern Europe must differ, to some extent, from that in the central sector. Important features of the defence of the North European area would be sea power and sea-borne air power and the decision here has therefore been to appoint an Admiral as Commander-in-Chief with overall responsibility to S.H.A.P.E. for the whole area and with land and air commanders under him. The appointments that have been made are as follows:

Commander-in-Chief: Admiral Sir Patrick Brind (*United Kingdom*).

Commander, Land Forces, Norway: Lieut.-General Wilhelm Von Tange Hansteen (*Norway*).

Commander, Land Forces, Denmark: Lieut.-General Ebbe Gortz (*Denmark*).

Commander, Allied Air Forces: Major-General Robert Taylor (*U.S.A.*).

THE SOUTHERN SECTOR

21. No command appointments have yet been made in the southern sector but the intention is that the land forces should be commanded by an Italian General. Special command problems arise, however, since the North Atlantic Treaty covers only the western part of the Mediterranean area and the Eastern Mediterranean lies outside it. Obviously the Mediterranean area, as a whole, has certain common defence problems of which account must be taken from the command point of view. Special problems also arise over Trieste, the control of the communications between France and her North African Colonies and the relation of the Mediterranean command to the British command in the Middle East. Moreover, the association of Greece and Turkey with North Atlantic planning in the Mediterranean area affects the Mediterranean Command problem also.

APPOINTMENTS WITHIN S.H.A.P.E.

22. The Chief of Staff at S.H.A.P.E. is Lieutenant-General A. M. Gruenther (*U.S.A.*). Under him there are three Deputy Chiefs of Staff:

Plans, Policy, and Operations: Air Vice-Marshal E. C. Hudleston (*United Kingdom*).

Administration: General de Corps d'Armee Marcel M. Carpentier (*France*).

National Affairs: Colonel Anthony J. D. Biddle (*U.S.A.*).

There are also five Assistant Chiefs of Staff:

Plans and Operations: General P. L. Bodet (*France*).

Intelligence: Major-General Sir Terence Airey (*United Kingdom*).

Organisation and Training: Major-General Festing (*United Kingdom*).

Logistics: Major-General E. H. Leavey (*U.S.A.*).

Personnel and Administration: Rear-Admiral Ferrante Capponi (*Italy*).

THE FUTURE OF THE EUROPEAN REGIONAL PLANNING GROUPS AND OF THE WESTERN UNION COMMANDERS-IN-CHIEF

23. On the day that the Supreme Allied Commander Europe assumed his command he was authorised by the five Brussels Treaty Powers to take over the responsibilities of the Commanders-in-Chief Committee and the staff and facilities of the land, sea, and air commands of Western Union were placed at his disposal. The three European Regional Planning Groups of N.A.T.O. have been requested by General Eisenhower to continue their work until their powers and functions have been absorbed by S.H.A.P.E. and its subordinate Commands or by subordinate agencies of the Standing Group.

SUPREME ALLIED COMMANDER ATLANTIC

24. The proposal to appoint a single Supreme Commander for the North Atlantic Ocean was fully discussed not only by the United Kingdom and the United States but by representatives of the other North Atlantic Powers concerned. It was unanimously agreed that the Supreme Commander should be an American officer and that his Deputy should be British. The appointment of a Supreme Allied Commander Atlantic (S.A.C.A.) was approved in principle at the North Atlantic Defence Committee held in Washington in October last and, at the joint session of the Council and Defence Committee held in Brussels in December, it was agreed that the Supreme Commander Atlantic should be appointed as soon as possible after the Supreme Commander Europe. The formal nomination by the United States Government of an American officer for appointment as Supreme Allied Commander Atlantic is now awaited; His Majesty's Government have already selected a British Admiral for appointment as Deputy Supreme Commander.

25. The Supreme Commander Atlantic's command covers broadly the North Atlantic Ocean but excludes British and European coastal waters and the English Channel. The exact limits of the Atlantic command and of Admiral Brind's responsibilities under S.H.A.P.E. for Northern Europe have not yet been finally settled. The Atlantic command will include an Eastern and a Western area. The Eastern area, which is obviously the more vital so far as this country is concerned will be under the command of a British Admiral in association with Coastal Command of the Royal Air Force. This British Admiral will be the Commander-in-Chief, Home Fleet, an appointment at present held by Admiral Sir Philip Vian. The Commander-in-Chief of the Eastern area would, in time of war, exercise command not only over British forces but also those of other North Atlantic Treaty Powers contributing naval forces in support of the Eastern Atlantic area. The area of the Western Atlantic will be under the command of an American Admiral and he will likewise control all other N.A.T.O. forces employed in support of that area.

26. In war time the S.A.C.A. would exercise under the general direction of the Standing Group the normal powers of a Supreme Commander. He will not in time of peace command any of the naval and air forces of this country that would be allocated to him in time of war, nor those of the other North Atlantic Treaty Powers except when specifically placed at his disposal for the purposes of carrying out combined training exercises.

REASONS FOR THE APPOINTMENT OF A SUPREME COMMANDER ATLANTIC

27. The reasons for the appointment of a Supreme Allied Commander Atlantic may be broadly stated as follows:

- (a) A single unified command for the whole North Atlantic Ocean is regarded as essential by the Chiefs of Staff of the various North Atlantic Powers. As the Prime Minister said in the House of Commons on February 26 last—

The outstanding lesson of the Battle of the Atlantic in the late war was that the Atlantic is one battlefield in which the mobile threat represented by the submarine must be matched by an equally flexible system of defence.

The advantages of speed and flexibility which will be gained by the appointment of a Supreme Commander could not be secured by retaining separate commands for the Eastern and Western Atlantic co-ordinated by the Standing Group which, while it is responsible for the higher military direction of the whole North Atlantic Treaty Area, is not designed itself to fight a Battle of the Atlantic.

- (b) The Atlantic is not only of vital importance to this country but is also the life-line of Allied forces operating in Europe. The North Atlantic countries which will contribute forces or bases for the defence of the Atlantic Ocean will be the United States, the United Kingdom, France, Canada, the Netherlands, Belgium, Norway, Denmark, Portugal, and Iceland. In view of the large number of nations involved, it seems clear that the co-ordination of operational matters by a committee is quite out of the question and that an overall Commander is needed to co-ordinate their efforts.
- (c) In peace there is an equal need to have an Allied Supreme Commander responsible for the development of plans and the conduct of combined training exercise of those forces which would be placed under his command in war.

THE APPOINTMENT OF AN AMERICAN OFFICER AS SUPREME COMMANDER ATLANTIC

28. In deciding upon the nationality of the Supreme Commander a number of factors had to be taken into consideration. The defence of the North Atlantic Ocean or of any part of it cannot be undertaken by one country alone; its defence can only be secured by all the North Atlantic Powers concerned acting in close concert and accepting some sacrifices for the common advantage. While the defence of the Eastern Atlantic is obviously of vital interest to this country, the defence of the Western Atlantic is of the greatest concern to the United States. Again, some account must be taken of the size of the naval and air forces which the various North Atlantic Powers would be able to provide for the defence of the North Atlantic Ocean. Our own contribution will be a great one, not only in the number of ships that we can make available, but also in the skill and experience of the Royal Navy and Royal Air Force in such matters

as convoy organisation and anti-submarine warfare. The overall resources of the United States Navy are, however, far greater than our own and only by a large deployment of these resources can we hope to fight successfully another Battle of the Atlantic.

29. His Majesty's Government are satisfied that for the following reasons British interests and, in particular, the defence of these Islands will be fully safeguarded:

- (a) The Supreme Commander Atlantic will take his orders from the Standing Group on which the British Chiefs of Staff are fully represented.
- (b) The Deputy Supreme Commander Atlantic will be British.
- (c) The command in the Eastern Atlantic will be held by a British Admiral.
- (d) The command of our Home Waters will be the direct responsibility of another British Admiral under the authority of the British Chiefs of Staff.
- (e) The Supreme Commander at Headquarters will have available a British Liaison Officer to represent directly to him the views of the British Chiefs of Staff on day-to-day problems.

30. A chart of the system of command in N.A.T.O. is contained in Appendix B.

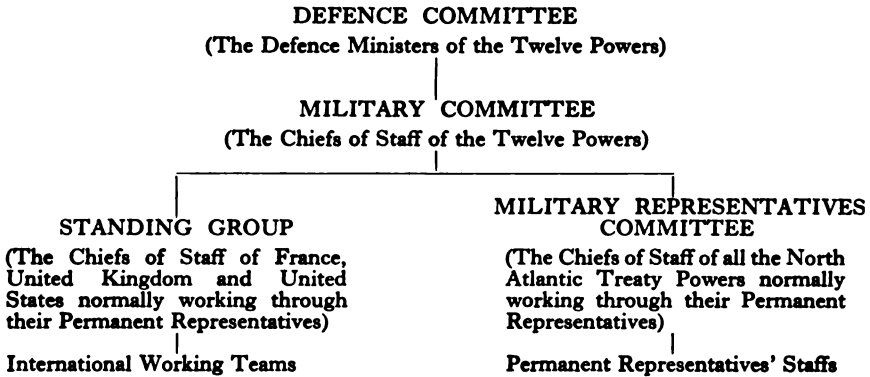
IV. CONCLUSIONS

31. The framework of an organisation for carrying out the instructions of the Governments and the Chiefs of Staff of the Twelve Powers and of a command system for the North Atlantic Treaty area has thus been created. It is important to recognise that it is no more than a framework. So far as the higher military direction of N.A.T.O. is concerned, the exercise by the Standing Group of an authority similar to that exercised by the Combined Chiefs of Staff in the last war has been accepted. There will no doubt be further constitutional developments within N.A.T.O. Part of the command structure has been built up but a number of other command problems remain for decision, especially the command in the Mediterranean.

32. The interests of the United Kingdom are fully represented throughout N.A.T.O. and in the various command appointments that have so far been made, but it would be quite wrong to consider the North Atlantic Treaty from a purely national standpoint. The Treaty is a bold and novel conception for the preservation of peace or, if need be, for the defence of the western world. As members of the North Atlantic Treaty Organisation, we must make some sacrifices in pooling our resources and our experience for the common good, but we can rightly expect to derive great benefit from our membership of this vigorous alliance of free peoples.

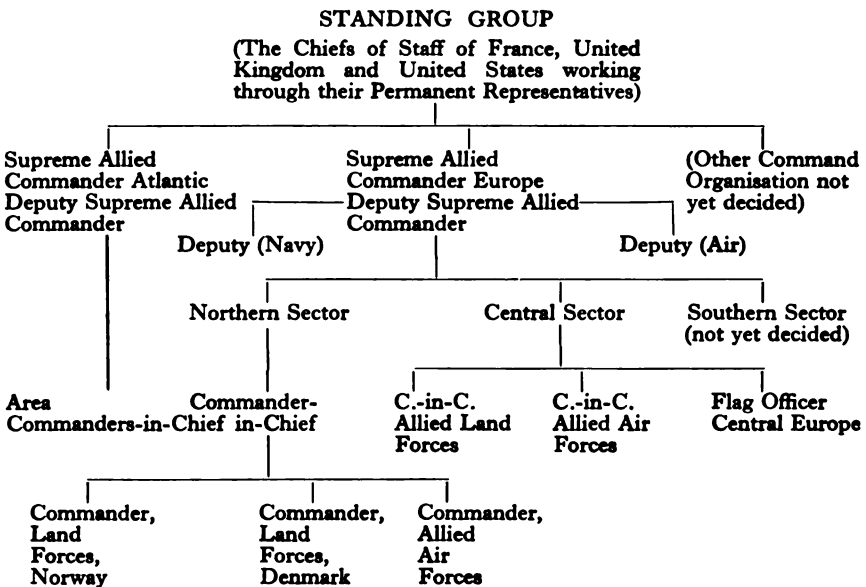
APPENDIX A

THE HIGHER MILITARY ORGANISATION OF N.A.T.O.



APPENDIX B

THE SYSTEM OF COMMAND IN N.A.T.O.



BRITISH AND FOREIGN ARMED FORCES

PRINCIPAL OFFICIALS

On April 1, 1951

GREAT BRITAIN

Minister of Defence: The Rt. Hon. E. Shinwell, M.P.

Chief Staff Officer: Lieutenant-General Sir Kenneth G. McLean, K.B.E. C.B.

Board of Admiralty

First Lord: The Rt. Hon. Viscount Hall.

First Sea Lord and Chief of Naval Staff: Admiral of the Fleet Rt. Hon. Baron Fraser of North Cape, G.C.B., K.B.E.

Second Sea Lord and Chief of Naval Personnel: Vice-Admiral A. C. G. Madden, C.B., C.B.E.

Third Sea Lord and Controller: Vice-Admiral M. M. Denny, C.B., C.B.E., D.S.O.

Fourth Sea Lord and Chief of Supplies and Transport: Vice-Admiral The Earl Mountbatten of Burma, K.G., P.C., G.C.S.I., G.C.I.E., G.C.V.O., K.C.B., D.S.O., L.L.D., D.C.L., D.Sc.

Fifth Sea Lord and Deputy Chief of Naval Staff (Air): Vice-Admiral M. J. Mansergh, C.B., C.B.E.

Vice-Chief of Naval Staff: Vice-Admiral Sir George Creasy, K.C.B., C.B.E., D.S.O., M.V.O.

Assistant Chief of Naval Staff: Rear-Admiral E. M. Evans-Lombe, C.B.

Parliamentary and Financial Secretary: L. J. Callaghan, Esq., M.P.

Permanent Secretary: Sir John G. Lang, K.C.B.

Army Council

President, Secretary of State for War: The Rt. Hon. E. J. St. L. Strachey, M.P.

Vice-President, Parliamentary Under Secretary of State for War, and Financial Secretary of the War Office: R. M. M. Stewart, Esq., M.P.

First Military Member, Chief of the Imperial General Staff: Field Marshal Sir William J. Slim, G.C.B., G.B.E., D.S.O., M.C.

Second Military Member, Adjutant-General to the Forces: General Sir John T. Crocker, G.C.B., K.B.E., D.S.O., M.C.

Third Military Member, Quarter-Master-General to the Forces: General Sir G. Ivor Thomas, K.C.B., K.B.E., D.S.O., M.C.

Fourth Military Member, Vice Chief of the Imperial General Staff: Lieutenant-General N. C. D. Brownjohn, C.B., C.M.G., O.B.E., M.C.

Fifth Military Member, Deputy Chief of the Imperial General Staff: Lieutenant-General Sir John F. M. Whiteley, K.C.B., C.B.E., M.C.

Permanent Under-Secretary of State for War: Sir George W. Turner, K.C.B., K.B.E.

Air Council

Secretary of State for Air and President of the Air Council: The Rt. Hon. Arthur Henderson, K.C., M.P.

Parliamentary Under-Secretary of State for Air and Vice-President of the Air Council: Aidan M. Crawley, M.P.

Chief of the Air Staff: Marshal of the Royal Air Force Sir John C. Slessor, G.C.B., D.S.O., M.C.

Air Member for Personnel: Air Chief Marshal Sir Leslie N. Hollinghurst, K.C.B., K.B.E., D.F.C.

Air Member for Supply and Organisation: Air Chief Marshal Sir William F. Dickson, K.B.E., C.B., D.S.O., A.F.C.

• *Vice-Chief of the Air Staff:* Air Chief Marshal The Hon. Sir Ralph A. Cochrane, G.B.E., K.C.B., A.F.C., A.D.C.

• *Deputy Chief of the Air Staff:* Air Marshal Sir Arthur P. M. Sanders, K.B.E., C.B.

• *Controller Supplies (Air):* Air Marshal J. N. Boothman, C.B., D.F.C., A.F.C. (*Ministry of Supply*)

Permanent Under-Secretary of State for Air: Sir James H. Barnes, K.C.B., K.B.E.

Commanders-in-Chief Home Defence (Designate) (Responsible to Chiefs of Staff)

Commander-in-Chief, Home Station: Commander-in-Chief, Portsmouth (at present Admiral Sir Arthur Power),

Commander-in-Chief, United Kingdom Land Forces: General Sir Miles Dempsey (Chairman).

Air Officer Commanding-in-Chief, Fighter Command: (at present Air Marshal Sir Basil Embry).

• Additional Member.

PRINCIPAL OFFICIALS OF ARMED FORCES COMMONWEALTH

	Ministry of Defence	Minister for Navy	C.O.S.	Minister for Army	C.O.S.	Minister for Air	C.O.S.
Australia ..	P. A. M. McBride	—	Rear Admiral J. A. Collins	J. Francis*	Lieut.-General S. F. Rowell	T. W. White	Air Marshal G. Jones
Canada ..	B. Claxton ..	—	Vice-Admiral H. T. W. Grant	—	Lieut.-General G. G. Simonds	—	Air Marshal W. A. Curtis
Ceylon ..	D. S. Senanayake †	—	—	—	Lieut.-Colonel A. M. Muttukumar	—	—
India ..	Sardar Baldev Singh	—	Vice-Admiral Sir W. E. Parry (R.N.E.)	—	General K. M. Cariappa (C.-in-C.)	—	Air Marshal R. Ivelaw-Chapman (R.A.F.) (C.-in-C.)
New Zealand ..	T. L. McDonald	—	Commodore J. E. Slaughter (R.N.)	—	Major-General K. L. Stewart	—	Air Vice-Marshal D. V. Carnegie (R.A.F.)
Pakistan ..	Liaquat Ali Khan †	—	Commodore H.M.S. Chodri	—	General M. Ayub Khan (C.-in-C.)	—	Air Vice-Marshal L. W. Cannon (R.A.F.)
South Africa ..	F. C. Erasmus	—	Commodore F. J. Dean	—	Major-General C. L. de W. du Toit	—	Brigadier J. T. Durrant †

* Minister of State for Army and Navy. † and Prime Minister. ‡ Director-General South African Air Force.

PRINCIPAL OFFICIALS OF ARMED FORCES

U.S.A. AND ATLANTIC PACT COUNTRIES OF WESTERN EUROPE

Standing Group : Air Chief Marshal Sir William Elliott (Great Britain), Vice-Admiral J. Wright (France), Lieut.-General Paul Ely (U.S.A.)

Country	Minister of Defence	Minister for Navy	C.O.S.	Minister for Army	C.O.S.	Minister for Air	C.O.S.
*U.S.A. ..	Robert E. Lovett	F. P. Matthews	Admiral F. P. Sherman	Frank Pace, Jr.	General J. Lawton Collins	Thomas K. Finletter	General Hoyt Vandenberg
Belgium ..	Colonel B. E. M. de Greef	—	Commander L. J. Robins	—	Lieut.-General J. Piron	—	General Major Aviateur Lucien Leboutte
Denmark ..	M. Harold Petersen	Vice-Admiral A. H. Vedel (C.-in-C.)	Rear-Admiral K. Lurdesten	—	Lieut.-General E. Gortz (C.-in-C.)	—	Lieut.-General Forslev (C.-in-C.)
France ..	M. Jules Moch	M. André Monteil	Vice-Admiral R. G. Lambert	M. May Lejeune	General de Corps d'Armée C. Blanc	M. André Maroselli	General d'Armée Aerienne C. F. Lecheres
Italy ..	Sgr. Randolfo Pacciardi	—	Vice-Admiral Emilio Farrari	—	Lieut.-General Ernesto Cappa	—	Lieut.-General Mario Almone-Cat
Luxembourg ..	M. Pierre Dufong	—	—	—	Colonel A. Jacoby	—	—
Netherlands ..	—	Rear-Admiral C. W. Moorman	Vice-Admiral E. J. Van. Holthe	M. C. Staf	Lieut.-General B. R. P. F. Hasselman	—	Lieut.-General I. A. Aler
Norway ..	M. Jens Chr. Hauge	—	Vice-Admiral C. Danielson (C.-in-C.)	—	Lieut.-General W. Hansteen (C.-in-C.)	—	Lieut.-General B. Øen (C.-in-C.)
Portugal ..	Lieut.-Colonel Fernando Dos Santos Costa	Captain A. Tomaz	Rear-Admiral Cunha Gomez	Brigadier Adolfo Abranches Pinto	General J. de Barris Rodriguez	—	General Alfredo Cintra

• General Omar Bradley is Chairman of the Joint Chiefs of Staff.

BRITISH AND COMMONWEALTH LIAISON OFFICERS

BRITISH

	Naval	Army	Air
Australia ..	Captain F. B. Lloyd	Major-General A. J. H. Cassels	Group Captain A. E. Dark
Canada ..	Captain G. E. Fardell	Brigadier G. R. Thubrow	Air Commodore A. P. Revington
Ceylon ..	Captain W. E. Banks (Captain of the Navy, Ceylon)	—	—
India	—	Brigadier T. C. Usher	Wing Commander C. A. Slee
New Zealand ..	Captain A. F. Campbell	Colonel G. H. Cree	Group Captain M. L. Heath
Pakistan ..	—	Brigadier A. P. Block	Wing Commander R. M. Bradley
South Africa ..	—	Brigadier C. E. R. Hirsch	Air Commandore P. D. Cracroft

COMMONWEALTH OFFICERS IN LONDON

	Naval	Army	Air
Australia ..	Captain (S.) P. Perry	Brigadier H. G. F. Harlock	Air Commodore A. L. Walters
Canada ..	Captain O. C. S. Robertson	Brigadier R. W. Moncel	Air Commodore J. L. Hurley
India	Captain A. K. Chatterji	Brigadier Sardar Har- narain Singh	Group Captain E. W. Pinto
New Zealand ..	Commander R. E. Harding	Brigadier G. H. Clifton	Air Commodore C. E. Kay
Pakistan ..	Commander A. Rashio	Brigadier S. Ghawas	Group Captain A. M. Morad
South Africa ..	(Military Adviser)	Brigadier H. G. Willmott	Commandant C. Gey- Van-Pittius

HEADS OF BRITISH SERVICES MISSION IN FOREIGN COUNTRIES

UNITED NATIONS. MILITARY STAFF COMMITTEE

Air Vice-Marshal G. E. Gibbs (*Chairman*).
Captain R. G. Mackay.
Major-General G. R. Reid.

BRITISH JOINT SERVICES MISSION. WASHINGTON

Air Chief Marshal Sir William Elliott (*Chairman*)
Admiral The Hon. Sir C. E. Douglas-Pennant.
General Sir Neil M. Ritchie.
Air Chief Marshal Sir George C. Pirie.

UNITED KINGDOM LIAISON MISSION IN JAPAN

Brigadier A. J. Ferguson.
Commander J. M. D. Gray.
Group Captain R. A. C. Barclay.

BURMA

Commander R. S. Christian-Edwards.
Major-General B. Temple.
Group Captain F. J. Manning.

EIRE

Major J. R. Britten.

GREECE

Rear-Admiral R. K. Dickson.
Major-General L. E. C. M. Perowne.
Air Commodore J. Hawtrey.

SAUDI ARABIA

Brigadier J. E. A. Baird.

BRITISH SERVICE ATTACHÉS ABROAD

County	Naval	Military	Air
Afghanistan ..	—	Colonel R. A. Conner	—
Argentina ..	Captain C. B. Alers-Hankey •	Brigadier R. G. Fullerton	Air Commodore W. E. Oulton •
Belgium ..	(Naval Attaché to Netherlands)	Colonel R. H. C. Drummond-Wolff	Group Captain L. C. Slee
Brazil ..	Captain R. C. M. Duckworth	(Air Attaché)	Air Commodore M. D. Crichton-Biggie
Bulgaria ..	(Naval Attaché to Poland)	Colonel E. S. Batchelor	(Air Attaché, Roumania)
Burma ..	—	—	Group Captain F. J. Manning (Air Adviser)
Chile ..	Captain J. Lee-Barber †	—	(Air Attaché, Peru)
China ..	—	—	—
Czechoslovakia ..	—	Colonel G. A. D. Young	Wing Commander V. A. Pope
Denmark ..	Commander D. H. Maitland-Makgill-Crichton	Lieut.-Colonel E. L. C. Edlmann	Wing Commander N. A. N. Bray
Egypt ..	Captain H. P. Henderson ..	Brigadier G. Goulburn	Air Commodore A. P. Campbell †
Finland ..	(Naval Attaché to Soviet Union)	Colonel F. G. W. Walshe	Wing Commander D. H. Fleet
France ..	Captain K. L. Mackintosh ..	Brigadier C. A. C. MacNab	Air-Vice-Marshal R. A. George
Greece ..	—	Colonel J. A. S. Crum	—
Hungary ..	(Naval Attaché to Poland)	Colonel R. D. Blackie	Wing Commander A. N. Davis
Indo-China ..	(Naval Attaché to Thailand)	Brigadier L. F. Field	Wing Commander N. P. Simmons
Indonesia ..	—	Colonel J. F. Whidborne	Wing Commander H. W. G. Andrews
Israel ..	—	Lieut-Colonel P. Pender-Cudlip	Wing Commander J. A. O'Neill
Iran ..	—	Colonel H. G. M. Dunn	Wing Commander W. I. C. Inness
Iraq ..	—	Brigadier J. H. R. Orlebar	—
Italy ..	Captain C. D. Bonham-Carter	Colonel E. R. Colwill	Group Captain P. H. Hanley
Japan and South Korea ..	—	Brigadier A. K. Ferguson	Group Captain R. A. C. Barclay (Air Adviser)
Mexico ..	(Air Attaché)	Colonel C. G. Irving-Bell §	Wing Commander A. F. Johnson

Netherlands	..	..	Commander W. E. J. Eames	Colonel T. C. Williamson	Group Captain J. M. D. Ker
Norway	..	..	Commander R. H. Mills	Lieut.-Colonel D. I. Robertson	Wing Commander W. V. Crawford-Compton
Poland	..	..	Captain R. G. Mills	Colonel J. E. F. Meadmore	Group Captain C. E. S. Lockett
Portugal	..	..	Commander C. S. Battersby	Lieut.-Colonel W. L. Consett	Wing Commander C. E. A. Garton
Peru	..	..	(Naval Attaché to Chile)	—	Group Captain E. S. Finch ||
Roumania	..	..	(Naval Attaché to Poland)	Colonel R. G. Turner	Group Captain R. E. G. Britain
Soviet Union	..	..	Captain R. I. A. Sarell	Colonel C. D. T. Wynn-Pope	Air Commodore I. C. Bird
Spain	..	..	Commander W. F. R. Segrave	Brigadier A. Murray	(Naval Attaché)
Sweden	..	..	Captain D. B. Wyburd	Lieut.-Colonel P. H. Graves-Morris	Wing Commander P. Burnett
Switzerland	..	..	—	Lieut.-Colonel D. J. R. Parker	Wing Commander J. J. Spencer
Syria	..	..	—	Lieut.-Colonel G. R. Heyland	—
Thailand	..	..	Commander G. A. Tilney	Colonel V. L. M. Wainwright	Group Captain K. N. Sayers
Turkey	..	..	Captain A. G. Poe	Brigadier C. R. A. Swynnerton	Air Commodore R. J. Legg
United States	..	..	Captain J. R. B. Longden ¶	Colonel J. C. Windsor-Lewis	Group Captain M. G. Philpott
Venezuela	..	..	(Air Attaché)	—	Wing Commander A. F. Johnson ¶¶
Yugoslavia	..	..	Commander H. F. Robertson-Aikman	Colonel G. R. G. Bird	Group Captain D. A. Garner

* Also accredited to Uruguay and Paraguay.

† Also accredited to Peru, Colombia and Ecuador.

§ Also accredited to Guatemala, Salvador, Honduras, Nicaragua, Costa Rica and Cuba.

|| Also accredited to Bolivia.

¶ Also accredited to Panama.

¶¶ Also accredited to Colombia, Cuba, Haiti, Domingo, and Honduras.

FOREIGN SERVICE ATTACHÉS IN LONDON

Country	Naval	Military	Air
Argentina ..	Captain Guillermo D. Plater (Military)	Colonel M. B. Carreras	Brigadier R. P. Olmedo
Belgium ..	Captain D. Borges Fortes (Military)	Colonel A. Bigwood	Major J. Ceuppens
Brazil ..	Captain Rafael Calderon	Lieut.-Colonel Jardar Fabricio	Air Brigadier H. Fleuss (Military)
Burma ..	—	—	—
Chile ..	—	—	—
China ..	—	—	—
Czechoslovakia ..	—	Colonel M. Langer	(Military)
Denmark ..	Commodore J. H. J. Jegstrup (Air)	H. H. Prince Georg of Denmark	Colonel T. P. A. Ørum
Egypt ..	—	Lieut.-Colonel M. H. el Maghraby	Group Captain H. Mahmoud (Military)
Finland ..	—	Major B. R. Ek	Colonel H. le Rancourt de Mimérand (Naval)
France ..	Rear-Admiral R. F. M. Blanchard	Brigadier-General M. A. Durososy	(Military)
Greece ..	Captain G. Zeppos	Colonel K. Papageorgopoulos	Lieut.-Colonel A. K. Saadoun (Military)
Iran ..	Commander Cheibani	Brig.-General M. Khosrovani	Lieut.-Colonel D. S. Fanali (Military)
Iraq ..	—	Lieut.-Colonel A. Marie	—
Israel ..	—	Lieut.-Colonel J. P. Salmon	Colonel H. E. C. Holtz
Italy ..	—	Lieut.-Colonel M. Janelli	Colonel B. P. Motzfelot
Jordan ..	Captain Paolo Mengarini	Major Selim Bey Karachy	—
Mexico ..	—	—	—
Netherlands ..	Commander P. A. Mulock van der Vlies Blk	Colonel J. K. H. da Roo Van Alder- werelt	—
Norway ..	Commander F. Frodesen (Military)	Colonel A. F. Munthe	—
Poland ..	—	Lieut.-Colonel A. Paszt	(Military)
Portugal ..	—	Lieut.-Colonel L. M. du Camara Pina	(Military)
Soviet Union ..	Commander J. N. Milheirico	Major General B. G. Razin	(Military)
Spain ..	Captain, 1st Class, Georgi P. Timchenko	Colonel Don Joaquin de Ysasi Ysasnendi	Lieut.-Colonel Don Carlos Rute
Sweden ..	Captain Rafael F. de Bobadillo	Brigadier T. Hedqvist	Colonel A. V. Falk (Military)
Switzerland ..	Commodore B. F. G. E. Thermenius	Colonel J. G. Rieser	(Military)
Syria ..	—	Colonel Mardam Bey	(Military)
Thailand ..	Captain Sawasdi Kongsiri	Colonel Amvov Chya-Rochana	Group Captain Harin Hongskula
Turkey ..	Captain Tefvik Sargut	Colonel T. Berkman	Lieut.-Colonel S. Atikkan
United States ..	Rear-Admiral D. S. Cornwell	Brigadier H. E. Kessinger	Brigadier-General J. W. Wood (Military)
Uruguay ..	—	—	Major M. de La Rosa (Military)
Venezuela ..	—	—	—
Yugoslavia ..	(Military)	Colonel A. Vukotic	—

INDEX

Abstract of Air Estimates, 1951-52. .240-41
 — Army Estimates, 1951-52. .432-33
 — Navy Estimates, 1951-52. .422-23
 Abyssinia, Italian invasion of, 3
 Acheson, Mr., as chairman of North Atlantic Council, 11
 Administrative Staff College, 299
 Admiralty, number of staff, 421
 —, policy of, 412
 Affray, H.M. submarine, loss of, 204
 Air Council, the, constitution of, 49, 312
 — Estimates, 1950-51. .46-47, 434
 — Training Corps, 316
 Airliners, American civil, 383
 —, civil, the larger British, 382
 Airships, development mostly experimental, 390
 Alexander, Lord, on request for Secret Session, 220
 Amphibious warfare, two schools of thought, 165, 166
 Andrewes, Vice-Admiral Sir William, 144
 Anglo-Egyptian relations, 223
 Argentina Air Force, 341
 — Navy, 161
 Ark Royal, H.M.S., launched by H.M. the Queen, 32
 Armoured divisions, need for manœuvring flexibility, 309
 Arms Basic Training Unit, 271
 Aircraft—
 all-jet military, 369-70
 anti-submarine, 376
 carriers, general design, requirements of, 177
 —, intermediate, 179
 —, miscellaneous types of, 180
 —, vital role played by the, 176
 development of bombers, 372-75
 " Flying-boats in War," 383
 general development of, 365
 high-speed flying, 368
 light, for military use, 387
 manufacture of helicopters, 387-89
 means of propulsion, 367
 military transport, 378-82
 primary trainers, 385-86
 production of, 366
 table of all- and jet-assisted bombers, 394
 — all-jet turbines, 396
 — " all-weather " fighters, 393
 — flying-boats, 395
 — helicopters, 395
 — large military transport, 394
 — large propeller turbines, 396
 — 650-m.p.h. jet, 393
 Vice-Admiral M. J. Mansergh on Naval Aviation, 378
 Army—
 absence of security for full career, 212
 a career for officers, 271
 addition to forces in Germany, 222
 anti-aircraft defence, 231

Army (*contd.*)—
 anxiety about officer recruitment, 211
 Apprentice Schools, 296, 297
 — Tradesmen Boys, 280
 armaments and stores, 430
 attractive and secured career, 280
 balance of tooth and tail, 216
 Basic Training Organisation, 295
 better Commonwealth co-operation, 226
 choice of regiment, 283
 Class " Z " reservists, 19
 commissions, direct entry, 276
 commitments in Middle East, 209
 — widely dispersed, 228
 composition and organisation, 227
 conditions of service, 271, 277
 Council, constitution of, 39
 defence of Far East, 227
 — Middle East, 227
 — Western Europe, 227
 discipline throughout the, 427
 distribution of forces, 224
 education of officers, 298
 efforts to improve living conditions, 431
 emergency measures introduced, 37
 equipment of the, 218
 Estimates, 1951-52. .30, 209, 424
 Far East Command, 292
 fighting against bandits in Malaya, 209
 forces in Korea, 424
 — Malaya, 425
 future requirements, 224
 garrison duty in Austria, 209
 — in Germany, 209
 general statement, 226
 health of, 429
 heroic action of Gloucestershire Regiment, 213
 high standard of welfare work, 428
 Home Commands, 292
 importance of junior officer, 212
 increase in pay, beneficial effect, 18, 280
 light tank *versus* heavy tank, 219
 Lyttelton, Mr. Oliver, on the pay rates, 211
 man-power, 211
 Middle East Command, 292
 Ministry of Labour and reserved occupations, 214
 movement of troops, 44
 National Service officers, 271
 — Servicemen posting to Territorial Army, 230
 number of active formations to be maintained, 229
 " Old Contemptibles," 293
 occupation duties in Trieste, 209
 personnel of Regular, 426
 pattern of training, 287
 plans for resettlement, 285
 procedure for selection of officers, 277
 production of Centurion tank, 219
 provision for expansion, 227
 qualification for pension, 281

INDEX

Army (*contd.*)—

- rates of pay, 282
- reforming of 11th (Armoured) Division, 38
 - Regular divisions, 286
 - 3rd Division, 38
 - 6th (Armoured) Division, 38
- Regimental Boys, 280
- Regular Commission Board, 275
 - commissions, entry to, 273
 - recruitment, 211
 - reservists, 216
- Reserve pay, 282
- reservists, Class "Z," 38
- resettlement in civil life, 428
- retention of time-expired regulars, 216
- training and manœuvres, 425
- scale of retiring pensions for officers, 278
- seen from Parliament, 209
- selection procedure, 284
- senior appointments, 39
- School of Health, 300
- short service commissions, need of, 276
- size and role of the, 221, 227
- strength of active, 1950..36
- substantial force in Hong Kong, 209
- suggested increase of Colonial forces, 217
- suspension of releases, 44
- system of training, 291
- tanks and deployment, 226
- terms of service in Regular, 281
- Territorial, composition of, 230, 231
- training with Allied countries, 289
 - Commonwealth countries, 289
 - university commissions, 275
- War Office Selection Board, 272
- with U.N. forces in Korea, 209
- "Z" Class call-up Scheme, 214
 - Reservists, refresher training, 232
- Artillery demonstration at Larkhill, 43
- Asia, American policy for, 86
 - , British policy for, 85
- Atlantic Treaty, the British obligations under, 173
- Atomic warfare, 113
- Attachés, British Service, abroad, 458-59
 - , foreign Service, in London, 460
- Attlee, Mr., announcement of defence programme, 5, 6
 - , appointments under North Atlantic Treaty, 12
 - , on defence preparations, 19
 - , on increases in pay for the Services, 18
 - , the "Z" Class call-up Scheme, 214, 215
 - , statement of British troops for Korea, 24
 - , statement on defence, 20
- Aviation, Naval, rapid growth of, 204
 - , Naval, training of National Service men, 33
- Baker, Air Marshal Sir John W., 318
- Bailey, Lieutenant-Commander J. S., 33
- Belgian Air Force, 340
 - Congo, rich deposits of uranium ores, 114
 - Navy, 158
- Bermuda, closing of dockyard, 416
- Bevin, Mr., statement by, 19

- Board of Admiralty, Constitution of, 28
 - , responsibilities of, 140
- Bolshevik Revolution, the, 63
- Bomber Command, headquarters of, 313, 344
- Bower, Major-General R. H., on development of the helicopter, 387
- Brazilian Navy, 161
- Briggs, Lieutenant-General Sir Harold, 23
- Britain, strategic interrelations important, 72
 - "Britannia" system, training of naval officers by, 182
- British and foreign armed forces, principal officials, 453
 - Army of the Rhine, joint manœuvres, 22
 - Services Mission, heads of in foreign countries, 457
- Brundett, Sir Frederick, 21
- Bulgarian Army, estimated strength of, 265
- Burma, liability to anti-communist world, 93
 - , national government's difficult task, 92
- , Training Missions in, 291
- Burmese Navy, 162
- Buzzard, Rear-Admiral Sir Anthony W., 29
- Cadets, Naval, entries compared, 192
 - , promotion from ranks, 192
 - , sixteen-year-old entry, 190
 - , Special Entry, 189
- Cairo Cathedral, war memorial dedicated in, 46
- Cairo, Conference of, 4
- Callaghan, Mr., statement on Naval Estimates, 26
- Canada, Air Cadet League of, 326
- Canadian Observer Corps, 326
- Canberra bomber, production accelerated, 48
- Casablanca, Conference of, 4
- Cazalas, Rear-Admiral P. G. L., 29
- Central Committee for Education, 428
- Chemical Warfare School, 295
- Chen Yi, mayor of Shanghai, 126
- Chetwode, Field-Marshal Sir Philip, 40
- Chief of Combined Operations, nomination of, 167
- Chiefs of Staff Committee, 3
- Chilean Navy, 161
- China, army and the revolution, 124
 - , civil war in, 123
 - , Kuomintang troops, 123
- Chinese Air Force, Russian influence in, 129
- Chinese Army—
 - equipment of, 127
 - estimated strength of, 126
 - heavy losses in Korea, 269
 - high standard of discipline, 127
 - Nationalist's guerrilla forces, 270
 - Liberation, 266-70
 - the Nationalist, 266-70
- Chinese Navy, 128, 162
- Churchill, Mr., as Minister of Defence, 2
 - , on higher direction of war, 3
 - , speech in House of Commons, 17
 - , statement on tank warfare, 301
- Chu Tek, "father" of Chinese Army, 124

INDEX

Civil Defence Exercise, "Jolly Jack," 22
 — Rescue Training Centres, 288
 — Staff College, establishment of, 288
 —, studies and exercises, 288
 Civilisation, Western, industrialism, 132
 Coastal Command, location of, 314
 —, role of, 346
 Combined Exercise, "Run Around," 2
 — operations Bombardment Battery, 169, 170
 — — Experimental Establishment, 168
 — Signal School, 170
 — training, Conference at Camberley, 21
 Committee of Imperial Defence, set up 1912.. 2, 3
 Commonwealth, the—
 Air Forces, 322
 co-operation in defence, 116
 differences between India and Pakistan, 121
 difficulties of controlling Empire forces, 121
 difficulty of raising large Colonial army, 121
 Europe as important theatre of operations, 120
 heavy responsibilities of U.K., 117
 liaison officers, 455
 looseness of Imperial link, 119
 officers in London, 455
 principal officials of armed forces, 454
 proposed responsibilities of members, 119
 responsibilities of, 116
 sounder footing of defence needed, 116
 suggested policy for improvement, 118
 urgent need of armed strength, 122
 world-wide influence of, 114
 Communism, attractiveness dwindling, 83
 —, its purposes and strategy, 63
 —, main objective of, 73
 —, Soviet, commands ten groups of conquest, 73
 Communist domination, world-wide purpose, 70
 —, international, programme of, 63
 —, strategy, principles of, 67
 —, theory underlying, 68, 69
 Courts-Martial Appeal Court, 22
 Crimean war, electric telegraph first used in, 1
 Cunningham, Admiral, on the atomic bomb, 166
 Cunningham-Graham, Vice-Admiral Sir Angus, 142
 Custance Committee, the, 185
 Czechoslovak Air Force, 341

 Danish Air Force, 340
 — Navy, 158
 Defence—
 administration of, 408
 civil preparations for, 408
 economic implications, 409, 410
 emergency measure, 16
 man-power, 15, 405, 406
 production, 407
 programme, Statement by Prime Minister in House of Commons, 405

Defence (*contd.*)—
 statement of, 1950-51.. 14
 structure of, 1-9
 total cost of, 408
 U.S. expenditure for, 251
 White Paper on, 14, 15, 16, 405
 Democracy or Communism, which is to dominate? 132
 Dempsey, General, appointment as Commander of home defence land forces, 225
 Dockyards, naval, administration of, 141
 Douglas-Pennant, Admiral the Hon. C. E., 28

 Ede, Mr. Chuter, at Civil Defence exercise, 22
 Eden, Mr. Anthony, on absence of "security for full career" in Army, 212
 Edleston, Admiral Sir John, 28, 144
 Egyptian Air Force, 341
 — Navy, 162
 Eisenhower, General, appointment as Supreme Commander in Europe, 8, 10, 12
 —, tour of Europe, 5
 Electric telegraph, invention of, 1
 Elliot, Air Marshal Sir William, Air Aide-de-Camp to H.M. the King, 53
 Ellwood, Air Marshal Sir Aubrey B., 317
 Embry, Air Marshal Sir Basil E., 314
 Exercise "Broadside" I and II, 352
 — "Cupola," 290, 352
 — "Emperor," 290, 353
 — "Scapa," 351
 — "Red Lion," 350
 Exercises, Western Union, 34

 Far East Air Force, location of, 319
 Fechteler, Admiral, appointment as Supreme Commander, North Atlantic, 12
 Festival of Britain, 1
 Fisher, Admiral Sir John, work on Selborne Scheme, 184
 Fighter Command, location of, 314
 Flag appointments, 28
 Fleet carriers, "the Core of the fleet," 178
 Foch, Marshal, as Generalissimo, 2
 Fogarty, Air Marshal Sir Francis J., 319
 Foreign Service Attachés, 460
 Formosa, estimated Chinese Nationalist forces in, 129
 —, the neutralising of, 123
 Foster, Air Marshal Sir Robert M., 315
 French Air Force, *Armée de l'Air*, 339
 —, *L'Aéronautique Navale*, 339
 French Army—
 commitments in Indo-China, 255
 Écoles d'Application, 257
 École de Cadres, 256
 equipment scanty, 257
 military expenditure increase, 255
 possible opposition to two-year conscript, 258
 proposed increase of, 254, 255
 service of conscripts, 256
 the *Disponibilité*, 257

INDEX

- French Navy, projected increases, 155
 Frogmen, special beach parties, 168
 Fuel, liquid, modern war impossible without, 114
- Geddes axe, retrenchment by the, 187
 Germany, slow progress in rearmament, 222
 Great Britain, three-year programme of rearmament, 10
 Great Exhibition, the, 1851..1
 Greek Navy, 158
 Greenland, R.A.F., base set up, 350
 Guderain, General, on tank warfare, 306
 Gurkhas, the Brigade of, formation of, 43
- Hall, Viscount, 25
 Harcourt, Admiral Sir Cecil, 141
 Harding, General Sir John, appointed A.D.C. General, 45
 Helicopter Association of Great Britain, 387
 Henderson, Mr., Statement on R.A.F., 48
 Hindenburg Line, breaching of by tanks, 304
 Hitler, faith in tank warfare, 301
 — on modern warfare, 136
 — on strategy in war, 136
 —, rise of, 3
 H.M. the King, approves medal for services in Malaya, 21
 —, as Air Commodore-in-Chief, R.O.C., 54
 —, presents colours to Coldstream Guards, 45
 Hollis, General Sir Leslie, 146
 Hokkaido, Soviet threat to, 76
 Home Command, location of, 315
 Home Guard, formation of a, 22
 —, nucleus organisation to be set up, 231
 Housing Loan (Armed Forces) Act, 1949.. 431
 H.R.H. the Duchess of Kent, Commandant of W.R.N.S., 39
 H.R.H., the Princess Royal, Air Chief Commandant of P.M.R.A.F.N.S., 53
 —, Major-General of W.R.A.C., 43
 Hsu Hsiang-Chien, Chief of Staff of Chinese Army, 125
 Hungarian Army, estimated strength of, 265
- Iceland, R.A.F. base set up, 350
 Imperial Defence College, vacancies allotted to, 21, 299
 — General Staff's annual exercise, 288
 India, failure of Communist party, 95
 —, loan of officers to, 291
 —, neutralist hand of foreign policy, 94
 —, the clash with Pakistan, 94
 Indian Air Force, organisation of, 327
 —, training of, 327
 —, types of aircraft, 327
 Indo-China, French problems in, 89
 —, importance of French recovery in, 89
 —, the political situation in, 89
- Indonesia, decline of authority of central government, 93
 —, the importance of, 93
 Infantry Commanders' Conference, 42
 Insects, danger of, in war, 102
 Institution of Naval Architects, 165
 Iranian Air Force, 342
 Iraqi Air Force, 342
 Iron Curtain, countries behind the, their resources, 59-62
 Isolationist policy, danger to United Kingdom, 4
 Italian Air Force, 341
 — Navy, strengthened by U.S. destroyers, 157
- Jarratt, Sir Arthur W., promoted to Hon. Captain R.N.V.R., 31
 Jean Bart, French battleship, completion of, 155
 John, Rear-Admiral Caspar, 29
 Joint Staff College course, 299
 Jones, Air Marshal Sir John Whitworth, 317
 "Joseph Stalin," the, heavy tank, 302
- Kashmir, the dispute over, 94
 Keightley, Lieutenant-General Sir Charles, 22
 Korea, autocratic government of South, 98
 —, climate one of extremes, 97
 —, difficult country for war, 97
 —, geographical position, 97
 —, Syngman Rhee as an exiled democrat, 98
 —, the Communists influence in North, 98
 Korean War—
 aircraft alone cannot gain victory, 404
 American transport excellent, 104
 armoured warfare in the, 301
 battle of Imjin, 240
 British Commonwealth 27th Brigade, 100, 228
 Centurion tank in, 240, 241
 characteristics of the combatants, 235
 Chinese cross the Yalu, 108
 Chinese infiltration tactics, 402
 comparative methods of defence and withdrawals, 245, 246
 the Crocodile flame-throwers, 247
 divided opinion on use of atom bomb, 401
 early successes of the northern forces, 99
 fall of Pyongyang, 107
 faulty ammunition, 244
 fidelity of native porters, 239
 friendly co-operation of American forces, 248
 heavy losses of Chinese forces, 234
 heroic action of Gloucestershire Regiment, 213, 243
 Koreans temperamental, 238
 lack of basic training of American troops, 104
 lessons from the, 5, 24, 41, 108-11, 233
 magnificent work of Royal Australian Regiment, 239, 244
 more helicopters needed, 248

INDEX

Korean War (*contd.*)—

- no opposition to U.N. aircraft, 99
- northern forces efficient, 102
- Red Air Force, new factor in, 234
- results of strategic bombing, 399
- Russian aid not inconsiderable, 110
- sense of inferiority of native troops, 238
- snipers a dangerous nuisance, 102
- stand by 170 Independent Motor Battery, 240
- success of American fighters, 403
- tactical air support not foolproof, 242
- the 24th American Division in, 97
- U.N. forces practically immune from enemy air attack, 403
- U.S. air force in, 241
- U.S. contingent in the, 239
- U.S. 1st Marine Division landed at Inchon, 100
- use of tanks by North Koreans, 301
- valuable part in Soviet strategy, 79
- winter clothing not yet solved, 247

- Labrador, base set up, 350
- Lambe, Vice-Admiral C. E., 29
- Lattre de Tassigny, General de, appointment in Indo-China, 90
- Lenin on strategy in war, 135
- League of Nations, the, 3
- Letter Boys, the King's, 1
- Liaison officers, British, and Commonwealth, 455
- Liddell-Hart, Capt., initial idea in development of tank, 305
- Lin Piao, most brilliant of Chinese military leaders, 125
- Liu Po-cheng, brilliant guerrilla commander, 125
- Lloyd, Air Marshal Sir Hugh P., 313
- Lloyd, Miss M. K., Director of W.R.N.S., 147

- MacArthur, General, estimated enemy strength in Korea, 233, 234
- , on bombing of enemy in Korea, 400
- , on North Korean fighting force, 235
- , on the importance of tank warfare, 305
- , statement on demarcation of forces, 404
- McCall, Vice-Admiral Sir Henry W. U., 29, 143
- McGrigor, Admiral Sir Rhoderick, 142
- Mackworth, Air Vice-Marshal on "Flying-boats in War," 383
- Mahon, quotation on naval strategy, 170
- Maintenance Command, location of, 317
- Malaya, army in, 288
- , the Briggs' Plan, 92
- , general service medal for service in, 21
- , improved security in, 92
- , war in, 23
- Malta, Conference of, 4
- Manchuria, Japanese invasion of, 3
- Mansergh, Vice-Admiral, on dearth of naval pilots, 205
- Mao Tse-tung as leader of Chinese Army, 124

- Marines, Royal, the, exercises by, 31
- , farewell parade of the King's and Regimental Colours, 31
- , in Malaya, 31
- Marshall, General, recall to active politics, 149
- Mechanical Transport School, 297
- Meteorological Research Flight, 439
- Middle East Air Force, location of, 318
- Middle East, commitments in, 288
- , oil vital for war-making powers of West, 73, 76
- Military College of Science, 296, 297
- Schools of Instruction, 286
- Minefields, operational value of, 194
- , submarine minelayer, 197
- , the "Porpoise" class minelayer, 197
- , use of, 196–98
- Minister of Defence, announcement by, 20
- , formation of, 2
- , scientific advisers to, 21
- Missiles, guided, 390–92
- Montgomery, Field Marshal, chairman of Defence Committee, 8
- , dedicates memorial to 8th Army, 46
- Morgenthau Plan, the, 138
- Muir, Major Kenneth, posthumous award of V.C., 44

National Service Bill, extension of service, 18

National Service, extension of, 286

— officers, opportunities for advancement, 272, 276

Naval—

- Academy, the, in 1733..181
- air branch, short service commission in, 188
- Air Service, headquarters of, 142
- air units, values of, 175
- aviation, Vice-Admiral M. J. Mansergh on, 378
- Command in Germany, 144
- officers, control of entry by Admiralty in 1837..183
- , educational training at Cambridge, 187
- , Special Entry Scheme, 186
- , the purple stripe, 188
- , training in 1837..182
- , training of in the nineteen thirties, 188
- personnel, 419
- policy, general requirements of our, 174
- strategy, influence on design, 173
- , reconnaissance first consideration, 176
- , three elements of, 172
- surface units, strategic roles of, 175
- Navy—
- abstracts of Estimates, 422–23
- administration of justice in, 420
- Admirals of the Fleet, new rules for promotion, 36
- amenities on latest ships, 203
- America and West Indies Station, 144
- ancillary services for, 147
- area of the Scotland Command, 142
- Nore Command, 141
- Arctic survival tests, 35

INDEX

Navy (*contd.*)—

- classes of reservists, 146
- conditions of service, 201
- constitution of Reserve Fleet, 143
- co-operation with Allied Navies, 414
- with Commonwealth Navies, 414
- East Indies Command, 145, 412
- Estimates, 1951-52.. 411
- events of Naval interest, 421
- exercises, Mediterranean and Home Fleet, 34, 35
- , with Allies, 414
- existing scale of pensions, 202
- Far East Station, 145
- Fleet changes, 34
- headquarters of Submarine Command, 143
- honours and awards, 35
- medical research, 418
- Mediterranean Fleet, 144
- modernisation and repair, 415
- National Servicemen, intake of, 205
- National Service Officers, 193
- Portsmouth Command, 141
- Plymouth Command, 142
- new construction and conversion, 414
- operational area of Home Fleet, 143
- organisation of, 140, 141
- pay and allowances, 201
- personnel of, 29
- position of Naval Reservists, 206
- principal strategical purposes of, 176, 177
- programme of new construction, 18
- research and development, 417
- retention of National Servicemen, 205
- Royal Fleet Reserve, 19
- service ashore and afloat, 202
- South Atlantic Squadron, 145
- standardisation continuing, 416
- statement on uniform, 32
- stores and equipment, 416
- strength of the Fleet, 413
- transfer of ships to Commonwealth Navies, 413
- tropical survival tests, 35
- two-power standard, 1
- works programme for 1951-52.. 418
- "Wavy Navy" stripes abolished, 207
- Netherlands Air Force, 340
- Navy, 159
- Nieh Tung-chen, acting Chief of Staff Chinese Army, 125
- North Atlantic Council, fourth session held in London, 11
- , Meeting in New York, 11
- , plan of, 8
- North Atlantic Treaty Organisation—
- appointments within S.H.A.P.E., 447
- central sector, 446
- Command System, 444
- Defence Committee of, 442
- higher Military Organisation, diagram, 451
- Military Committee, 443
- northern sector, 447
- southern sector, 447
- Supreme Commander for Atlantic, 448
- system of Command in, diagram, 451
- Western Union Commanders-in-Chief Committee, 445

- North Pole, R.A.F., flights over, 351
- Norwegian Air Force, 340
- Navy, 159

- O'Donnell, Major-General, on strategic bombing in Korea, 399, 400
- Officer Cadet School, procedure of admission, 272
- Oliver, Vice-Admiral Sir Geoffrey, 145

- Pace, Mr., on tank warfare, 301
- Packer, Vice-Admiral Sir Herbert, 28, 145
- Pakistan, loan of officers to, 291
- , no contribution to holding of Middle East, 94
- Pay, increase for all ranks, 18
- Peng Te-huai, military administrator of Chinese army, 125
- Peruvian Navy, 161
- Plato on the biological cause of war, 131
- Pleven plan, the, 6
- Polish Army, organisation of the, 265
- Population, over-, bottom of world unrest, 139
- Portal, Admiral Sir Reginald, 142
- Portsmouth, suspected sabotage at, 17, 33
- Portugal and the Western Defence, 55
- Portuguese Navy, 159
- Power, Admiral Sir Arthur J. Power, 28, 141
- Prinz Eugen, the, escape of from Brest, 175

- Q.A.R.A.N.C., commissions in, 279
- Quebec, conference of, 4

- R.A.A.F., expansion programme and role, 323
- , increase of personnel in, 19
- , organisation of, 323
- , types of Aircraft, 324
- R.A.F.—
- anti-submarine operations, 351
- auxiliary and reserve forces, 437
- bases set up at Stornoway, 350
- Bomber Command, headquarters of, 344
- British Air Forces of Occupation (Germany), 318
- cadets flying pay, 357
- Changes in period of service, 52
- Class "G" reservists, 19
- Coastal Command, headquarters of, 346
- combined Exercise, "Emperor," 50
- Command organisation, 313
- constitution of Air Council, 49
- creating interest for National Service—
- man, 361
- defence of sea communications, 346
- display at Farnborough, 51, 353
- emergency measures, 48
- entries satisfactory for ground crews, 359
- Exercise "Ariel," 363
- "Broadside," 352
- "Cupola," 50, 352
- "Emperor," 353
- "Red Lion," 350
- "Scapa," 351

INDEX

R.A.F. (*contd.*)—

- Exercises planned for 1951... 354
- Far East Air Force, 319
- flight over North Pole, 50
- Fighter Command, headquarters of, 345
- first jet crossing of Atlantic, 349
- flights in the Arctic, 351
- Flying Training Command, 315
- formation as separate service, 2
- headquarters of Far East Air Forces, 348
- of Middle East Air Forces, 348
- high-altitude tests over Arctic Ocean, 50
- general statement on, 434
- Home Command, 315
- importance of mobility of striking power, 349
- increase in equipment, 51, 438
- in front line strength, 434
- of fighters and bombers, 18
- of married quarters, 363
- Inspectorate-General of, 313
- Lancaster squadrons, re-equipment by Washingtons, 344
- main operational roles, 344
- Maintenance Command, 317
- manning of, 321, 356
- maritime exercise by, 353
- maximum age of entry, 363
- Middle East Air Force, 318
- National Servicemen eligible for aircrew service, 356
- new phase of development, 364
- No. 90 Group, 318
- objects of reorganisation, 52
- operational training of, 343, 348
- opportunities for advancement in, 358
- organisation and role, 312
- outstanding flights, 51
- pay in the, 357, 358
- pilots and navigators, accelerated entry, 359
- plan for doubling jet-fighter strength, 46
- policy of commissioning, 357
- programme for development airfields, 438
- results of lengthening National Service, 361
- schools and colleges, 320
- senior appointments, 49
- statement by Secretary of State for Air, 48
- summary of personnel, 435-37
- Tactical Air Force, 347
- Technical Training Command, 317
- Transport Command, 317, 346
- R.A.M.C., short service commissions for women doctors, 279
- R.C.A.F., expansion programme and role, 324
- , operations and training, 325
- , organisation of, 324
- , reserves of, 326
- , subsidiary roles of, 326
- , three-year expansion programme, 326
- , types of aircraft, 325
- Raw, Rear-Admiral S. M., 143
- Regimental Boys' Units, 296
- Rhodesian Air Training Group, 315
- Air Training Group, 319
- R.N.V.R., extensive programme of exercises, 30
- Robb, Air Chief Marshal Sir J. M., 313
- Royal Air Force Regiment, 320
- Royal Air Force Technical College, 317
- Royal Air Force Volunteer Reserve, 316
- Royal Auxiliary Air Force, 316, 437
- Royal Indian Air Force, 322
- Royal Marines in Korea, 31
- Royal New Zealand Air Force, organisation of, 327
- , types of Aircraft, 328
- Royal Observer Corps, 320
- , celebrates Silver Jubilee, 53
- , co-operation with Fighter Command, 345
- , exercises by, 50
- Royal Pakistan Air Force, 322
- , history of, 328
- , organisation of, 328
- , reserves of, 329
- , training of, 328
- , types of aircraft, 328
- Rumanian Army, estimated strength of, 265
- Russell, Vice-Admiral the Hon. Guy H. E. Russell, 29, 145
- Russian Army, *see* Soviet Army
- Russian Navy, *see* Soviet Navy.
- Russo-Japanese War, developments in warfare since, 132
- , use of sea-mines in, 194
- Sabotage, acts of, 33
- Salmon, Air Commandant N. M., 320
- Sandhurst, alternative entry to, 273, 274
- , the course at, 275
- , war memorial dedicated, 45
- School of Artillery, 297, 300
- School of Combined Operations, inter-Service establishment, 169
- School of Infantry, 298, 300
- School of Land/Air Warfare, 170, 299
- School of Military Engineering, 300
- School of Signals, 300
- School of Sea-Air Warfare, 170
- Science, application of, in industry, 114
- , influence of, on strategy, 112
- Sea-mines, buoyant, 196
- , contact, 195
- , counter measures against, 198-99
- , drifting, 196
- , ground, 196
- , influence, 195
- , potential menace of, 194
- , Russian adaptability in use of, 200
- Selbourne Scheme, the, 184, 191
- Select Committee on Estimates, 1950... 213
- Shadwell Committee, the, 183
- Sherman, Admiral, report to U.S. Congress, 151
- S.H.A.P.E., General Eisenhower in command, 445-46
- Shinwell, Mr., announcement on Home Guard, 231
- , on equipment for army, 218, 220
- Siam, alignment with Western powers, 91
- Simpson, Rear-Admiral G. W. G., 29, 144
- Sino-Soviet pact, the, 124
- Slayter, Rear-Admiral W. R., 29, 146

INDEX

- Slessor, Sir John, Speech at Mansion House, 343
- Slim, Field-Marshal Sir W., 21
- Smuts, Field-Marshal, Jan Christiaan, death of, 40
- Sonobuoys, use of the, 150
- South African Air Force, history of, 329
- , organisation of, 329
- , reserves of, 330
- , training of, 329
- , types of aircraft, 330
- South-East Asia, Aim of Communists in, 89
- , American economic aid to, 87
- , area of weakness, 88
- , revolutionary change in, 88
- South Korean Navy, 162
- Soviet aircraft, 369
- Soviet Air Force, bombers of, 337
- , estimated first line air strength, 264
- , fighters of, 336
- , precise information of strength rare, 336
- , low-flying attack machines, 337
- , trainers of, 339
- , transports of, 338
- Soviet and Western Strategy, 63-85
- Soviet Army—
- armour and artillery of, 262
- economy of administrative overheads, 261
- lavish training of officers, 260
- low scale of radio and radar, 263
- formidable antagonist, 266
- great physical endurance of conscripts, 259
- military aviation, 264, 265
- parachute troops, 264
- peace establishment of, 260
- possible use of horse cavalry, 264
- previously mass-produced, 258
- punishments severe, 259
- rate of conscription, 259
- reorganised and trained, 258
- ruled by iron discipline, 259
- service confers prestige, 259
- two types, armoured division, 262
- , infantry division, 263
- world's largest conscript army, 259
- Soviet Navy, still an enigma, 156
- , submarine fleet a cause of apprehension, 157
- Soviet, political officers, of the, 260
- , preparation for partisan warfare, 266
- , secret police, power of, 260
- Spanish Navy, 160
- Stalin, on the defeat of Hitler, 61
- , quotations from Lenin by, 63, 64, 66, 67
- Steele, Air Marshal Sir Charles R., 314
- Stevens, Rear-Admiral J. F., 29
- Stornoway, R.A.F. base set up, 350
- Strachey, Mr., at Civil Defence exercise, 22
- , on wide commitments of army, 209
- Strafford, Air Vice-Marshal S. C., 320
- Strategy, Soviet, 73
- , Western, comment on, 84
- Supplementary Reserve, recruiting for, 429
- Sweden, highest importance of iron ore, 76
- Swedish Air Force, 339, 340
- Navy, 160
- Swinton, Colonel E., early designer of tank, 303
- Sueter, Commodore M., early work on tank design, 303
- Supplementary Reserve, Commissions in, 273
- , constitution of, 285
- , service in, 273
- Tank, the, development after World War I, 305, 306
- , origin of its name, 304
- , prospect of nullifying, 311
- warfare, defensive technique developed by Rommel, 307
- , its future, 301
- , success in North Africa, 307
- Technical Training Command, location of, 317
- Teheran, conference of, 4
- Territorial Army, build-up of, 285
- , Commissions for women in, 279
- , composition of, 230, 231
- , growth delayed, 429
- , officers, new responsibilities, 272
- , reorganisation of, 41
- The Times*, on North Atlantic Treaty appointments, 12
- Theak, Air Vice-Marshal W. E., 318
- Thomas, Major-General, chief of combined operations, 21
- Tibet, Peking announces agreement with, 71
- Tizard, Sir Henry, 21
- Transport Command, location of, 317
- Trieste, visit of naval commission to, 158
- Truman, President, meets General MacArthur on Wake Island, 107
- , on rearmament momentum, 250, 251
- Turkish Air Force, 341
- Navy, 160
- United Nations Organisation, Security Counsel of, 24
- U.S., principal officials of armed forces, 455
- U.S.A.F.—
- bombers of the, 332
- expansion, 251, 331
- F-86A Sabre, 332
- fighters of, 331
- helicopters of the, 334
- jet fighters, 332
- Naval aircraft fighters, 334
- patrol aircraft, 335
- rapid expansion of, 331
- reconnaissance aircraft, 333
- strike aircraft, 335
- trainers of the, 334
- transport aircraft, 333
- U.S. Atomic Energy Commission, 251
- U.S. Army—
- age of call-up, 252
- combat element, 253
- command element, 253
- composition of regimental headquarters, 253

INDEX

U.S.A.F. (*contd.*)—
 duties of medical battalion, 253
 forces of, 250
 increase of forces for Germany, 251
 National Guard and Reserve, 250
 Organised Reserve Corps, 250
 question of excessive overheads, 254
 rearmament programme, 250
 service element, 253
 strength of infantry division, 252
 superbly equipped, 254
 three elements of infantry division, 252
 war establishment of armoured division, 252
 U.S. Marines, expansion of, 251
 U.S. Navy—
 Aircraft carriers, increased strength, 152
 atomic experiments by, 151
 battleships in commission, 152
 cruisers, building-up the strength of, 153
 destroyers, active strength of, 153
 fleet exercise, 151
 large increases in strength, 149
 "Mighty Mouse" rocket, 151
 naval aviation, large increase in, 154
 new techniques and designs in mine-sweepers, 151
 rapid progress of guided missile, 151
 rearmament programme, 150
 steady progress in anti-submarine measures, 150
 strength of personnel, 149
 submarines, increased building of, 153
 subsidiary craft, increase of, 154
 sum voted for the fiscal year, 149
 the "Guppy" programme, 150
 U.S. universal service and universal military training, 251
 University Air Squadrons, 316

Vasse, Air Commodore G. H., 320
 Venezuelan Navy, 162
 Vian, Admiral Sir Philip, 143
 Vietnamese Army, building up of, 88

Walmsley, Air Marshal Sir Hugh S. P., 315
 War, an expression of industrial civilisation, 138
 —, causes of, 130, 131
 —, great changes in transportation, 134
 —, influence of science on, 133
 —, 1914–18, the, lessons of, 2
 War Office Commission Board, 275
 War Office Selection Board, duties of, 272

Warne-Browne, Air Marshal Sir Thomas A., 317
 Washington Conference, "Arcadia," 4
 Wavell, Field Marshal the Earl, death of, 40
 Williams, Air Marshal Sir Thomas Williams, 22, 318
 Wilson, Woodrow, on the causes of war, 131
 —, the effect of his "Fourteen Points," 138
 Weather forecasts, 438
 Western Defence—
 Denmark's position in, 56
 Germany's approach to, 58, 59
 Great Britain concentrated target to air attack, 57
 Italy's position in, 58
 neutrality of Eire, 56
 Norway's part in, 56
 problem of the Middle East, 57
 strategic importance of Great Britain, 56
 Sweden and the, 56, 59
 Switzerland's neutrality, 57
 Western Pacific, importance of Japan, 95
 —, need of collective security, 96
 Women's Royal Naval Reserve, 208
 Women's Services, 427
 World War I, emergence of tactical theories from, 135
 —, success of the British tanks at Amiens, 304
 —, total mining losses in, 195
 World War II, ineffectiveness of reconnaissance force, 175
 World War II, ferocity of, 132
 —, peace politically lost by Anglo-American Powers, 138
 —, sea power dominated land power, 137
 —, value of sea power in, 137
 W.R.A.C. enlistment for women in, 281
 —, H.R.H. Princess Royal, Major-General of, 43
 —, permanent career for women officers, 278
 —, qualification for commission, 278, 279
 —, qualification for pension, 282
 W.R.A.F., Air Commandant N. M. Salmon, Director of, 52
 —, exchange scheme of officers, 52
 —, recruitment not too encouraging, 362
 —, short-service commissions, 53
 W.R.N.S., established as permanent force, 30
 —, headquarters of, 147

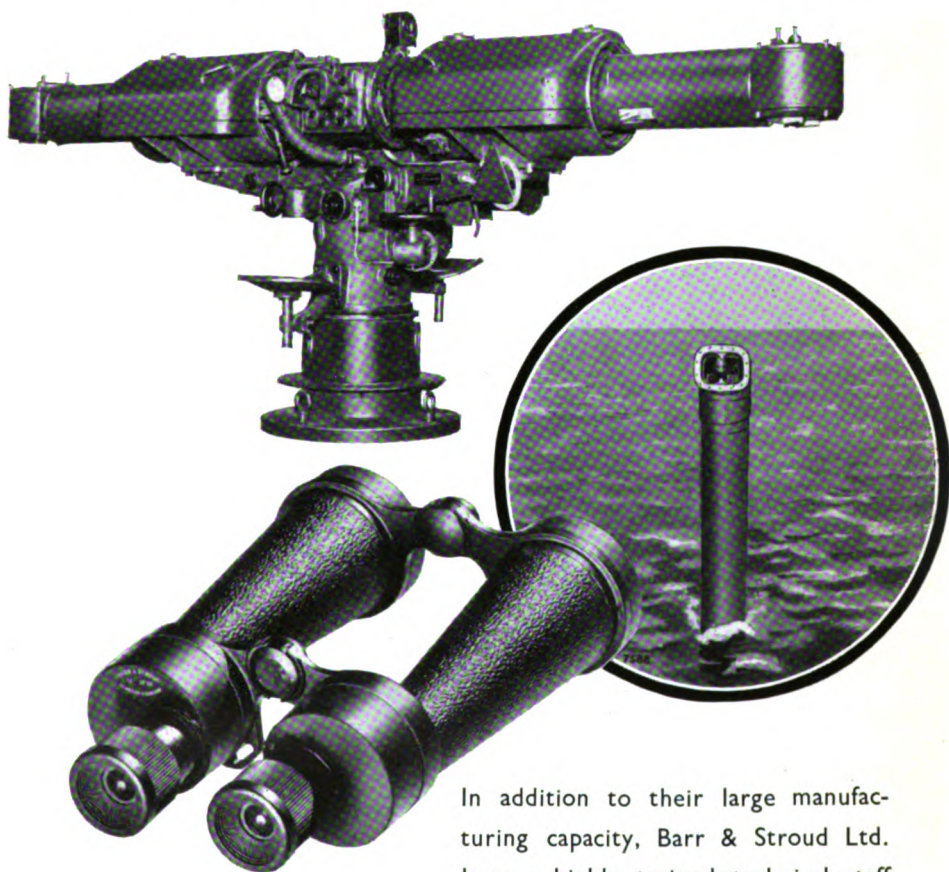
Yeh Chien-ying, military governor of Kuangtung province, 125
 Yugoslav Navy, 161

RANGEFINDERS

SUBMARINE PERISCOPES (BINOCULAR AND MONOCULAR TYPES)

FIRE CONTROL GEAR

PRISMATIC BINOCULARS, etc.



In addition to their large manufacturing capacity, Barr & Stroud Ltd. have a highly trained technical staff with up-to-date equipment for carrying out a wide variety of research, development and design.

BARR & STROUD LTD.

ANNIESLAND, GLASGOW, W.3

15 Victoria St., London, S.W.1

THE ARMY QUARTERLY

Editor

BRIGADIER C. N. BARCLAY, C.B.E., D.S.O.

Published by

**WILLIAM CLOWES AND SONS, LIMITED
LITTLE NEW STREET, LONDON, E.C.4**

Price 7s. 6d. net, post free

The Army Quarterly, which was first published in 1920, caters for all those who are interested in military topics. It contains articles on current military matters, political and historical articles of interest to the Services, and it aims at helping those studying for the Staff Colleges.

The Annual Subscription is £1 10s. 0d. (post free to any part of the World) and payment may be made either direct to the Publishers or through the Bank, for which latter purpose a form may be obtained from the Publishers.

1871

1872

1873

1874

YD 13097

UNIVERSITY OF CALIFORNIA LIBRARY
BERKELEY

Return to desk from which borrowed.
This book is DUE on the last date stamped below.

3Mar'52MC

29Feb 5 2LU

14Mar 5 2SP

24Mar'53BH

MAY 1 2'1953 LU

26May'53BH

MAY 2 6 1953 LU

12Jun'53VL

AUG 1 1956 LU

LD 21-95m-11,'50(2877s16)476

